

3.1 Topography and Bathymetry

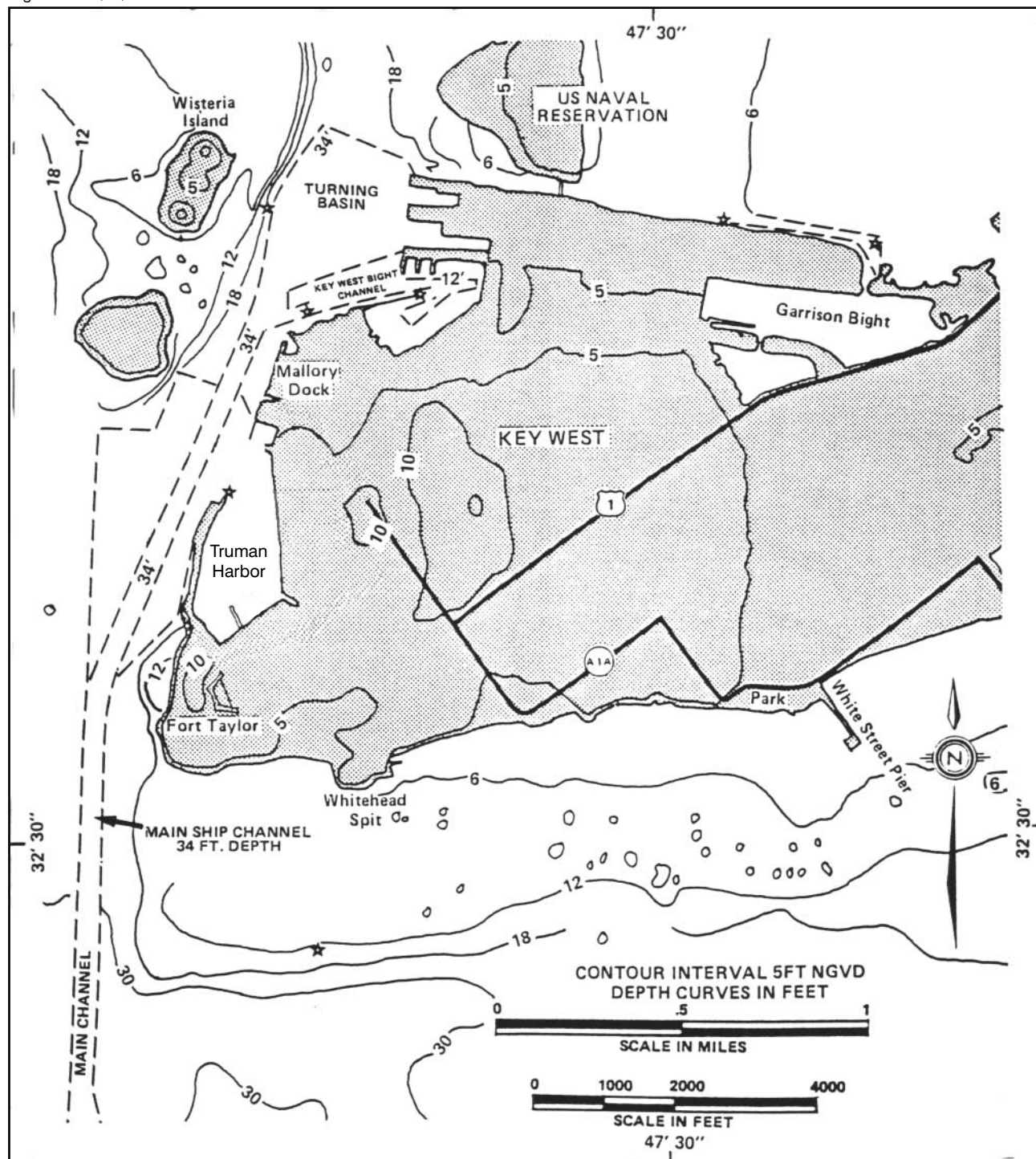
The Truman Waterfront is located on the east side of Key West Harbor and the main ship channel (see Figure 3-1). The entire property is approximately 4 to 5 feet (1.2 to 1.5 meters) above sea level and is uniformly flat. The Truman Harbor, created by construction of the Mole Pier in 1916, covers approximately 50 acres (20 hectares; CE Maguire, Inc. 1981). (In this EA, references to the harbor mean the Truman Harbor; Key West Harbor is always referred to as such.) The harbor entrance faces west-northwest and is approximately 500 feet (152 meters) wide.

The harbor was dredged by the Navy in 1965, at which time the main ship channel and Key West Harbor were also dredged, from an existing depth of 30 feet (9 meters) to a depth of 34 feet (10 meters) below mean low water (CE Maguire, Inc. 1981). Portions of the harbor were dredged again in late 1985 when all of the finger piers except Pier 8 (the proposed ferry terminal dock) were removed. Twenty-foot- (6-meter-) deep limerock ledges on which these piers were built were excavated to a depth of 34 feet (10 meters). An area of accumulated sediment at the southernmost end of the harbor was also dredged to a depth of 8 to 10 feet (2.4 to 2.9 meters; U.S. Navy 1986, Demes 2000).

3.2 Geology and Soils

Soils on the Truman Waterfront property were created from material dredged from the ship channel and Key West Harbor. The soils are classified as the Urban Land soil association and consist of sand, shell, and limestone fragments mixed with small amounts of marine sediments (U.S. Navy 1983). These unconsolidated soils are very permeable and, therefore, despite the property's flat topography, drainage is good.

Two types of marine sediments occur at the site. Sandy sediments, which predominate along the outer side of the Mole Pier and on Truman Beach at the south end of the Mole Pier, are composed primarily of calcareous (i.e., calcium carbonate) remains of algae, corals, and other invertebrates. Lime mud, which is predominant in Truman Harbor, is composed almost exclusively of very fine calcium



SOURCE: E & E after U.S. Navy 1986.

© 2000 Ecology and Environment, Inc.

Figure 3-1 TOPOGRAPHY AND BATHYMETRY IN THE VICINITY OF TRUMAN WATERFRONT

carbonate particles derived from calcareous algae (U.S. Navy 1983). These very fine white sediments are easily suspended by currents and turbulence and give the normally clear local waters their chalky appearance when sustained high winds generate waves and turbulence.

3.3 Hydrology and Water Quality

3.3.1 Hydrology

Key West is subject to mixed semidiurnal tides (i.e., generally two high and two low tides per day) with a mean range of 1.3 feet (0.4 meters) and a spring tide range of 1.8 feet (0.5 meters). During flood tide, the tidal current flows toward the Gulf of Mexico, and during ebb tide, the current direction is toward the Atlantic Ocean. Currents in the main ship channel near the Mole Pier average about 1.7 feet per second (0.5 meters per second) during peak flood tide, and tidal currents increase to an average of about 2.9 feet per second (0.9 meters per second) during peak ebb tide (CE Maguire, Inc. 1981).

The Mole Pier effectively shelters the harbor, reducing natural wave heights by over 36%. The west-northwest orientation of the harbor entrance is exposed to direct or near-direct winds only 20% of the time. During periods of northwest winds (usually during winter months), wave heights and harbor circulation may increase significantly. Wave heights are less than 2 feet (0.6 meters) about 50% of the time. The potential for standing wave oscillation caused by resonance of wave action within the harbor is negligible. The reduced wave energy and currents reduces circulation within the harbor, thereby decreasing flushing of the harbor. The harbor exhibits a weak inner harbor counter-clockwise circulation. This weak inner harbor circulation has created an area of sedimentation and accumulation of debris in the southern corner of the basin where the existing boat ramp is located (CE Maguire, Inc. 1981; U.S. Navy 1986).

Like most of Key West, the entire Truman Waterfront property is within the 100-year floodplain and susceptible to storm surge flooding. The potential for strong currents and wave action compounds the flood hazard. Storm waves can approach from either the Atlantic Ocean or the Gulf of Mexico. During a 100-year storm surge, the shoreline of Key West could experience waves with crest elevations as high as 12 feet (3.6 meters) above the National Geodetic Vertical Datum (NGVD). The 10-year stillwater flood elevation is 3.9 feet (1.2 meters) NGVD. About 86% of the island below 5-foot (1.5-meter) elevation is subject to flooding from lesser storm surges about once every 15 years (U.S. Navy 1986).

3.3.2 Water Quality

Surface Water

The waters surrounding Key West and the Florida Keys are designated by the State of Florida as Class III, Outstanding Florida Waters (OFW; Chapter 62-302, Florida Administrative Code [FAC]). This water quality classification essentially prohibits any significant decrease in ambient water quality. As an artificial waterway, Truman Harbor is exempt from the OFW designation. Water quality in the harbor is subject only to Class III water quality standards.

Historically, water quality in the Florida Keys has been excellent, but in recent years degradation of water quality has been implicated as a cause of declining coral recruitment, seagrass die-offs, and increases in the frequency and size of fish kills (United States Environmental Protection Agency [EPA] 1992; NOAA 1996; City of Key West 1997a).

In the Key West area, the major pollutant point source is the Key West Sewage Treatment Plant, which discharges an average of 6.28 million gallons per day (mgd; 23.77 million liters per day [mld]) of treated wastewater to the Atlantic Ocean approximately 3,300 feet (1,000 meters) south of Truman Annex. Monitoring in 1998 indicated that all permitted water quality criteria except cyanide were being achieved. The City of Key West applied for an increased mixing zone to rectify the cyanide violation (Rios 1998). Prior to 1989, this outfall discharged over 5.8 mgd (21.96 mld) of raw sewage (City of Key West 1993; City of Key West 1997b).

Other pollutant types and sources affecting local water quality include small fuel/oil spills from commercial and recreational boats, and stormwater runoff, which contains hydrocarbons, pesticides, herbicides, and heavy metals. Liveaboard boats, which are numerous in some nearshore waters of Key West, are also sources of raw sewage. A report prepared for development of the Water Quality Protection Program for the Florida Keys National Marine Sanctuary (FKNMS; EPA 1992) contains a thorough review of pollutant types and sources and their effects on water quality in the Florida Keys.

There are no fresh water inputs into Truman Harbor, so water quality is influenced by tides, stormwater runoff, and activities within and surrounding the harbor. Past land-based pollutant sources on the Truman Waterfront property include leaking underground storage tanks (USTs) and accidental releases of petroleum products (see Section 3.5 Environmental Contamination). The stormwater system discharges untreated stormwater from portions of the site directly into the harbor (City of Key West 1999).

Ambient water quality parameters were measured at eight locations around Key West in January and February 1985 by the Florida Department of Environmental Protection (FDEP) to determine baseline water quality conditions prior to the designation of the Florida Keys as OFW. Nutrient levels were

highest in Key West Bight and Garrison Bight, both of which are areas with marinas and reduced circulation (U.S. Navy 1986).

Water quality sampling was conducted in Truman Harbor on March 13, 1986, as part of the Environmental Impact Statement (EIS) for the Navy's proposed Gulf Coast Strategic Homeporting action (U.S. Navy 1986). *In situ* and analytical water quality measurements within the harbor and outside the harbor indicated good water quality in both locations with minor differences between them. Turbidity generated by wind-induced turbulence was greater in the ship channel than in the harbor. The water samples were analyzed for EPA-designated priority pollutants (organic compounds, pesticides, and polychlorinated biphenyls [PCBs]), total phenols, metals, and nutrients. Detectable levels of cadmium, copper, lead, and zinc were measured, as well as nitrogen and phosphorus compounds. The concentrations of metals were slightly higher in the harbor than in the channel, whereas nitrogen concentrations were higher in the channel than in the harbor. All priority pollutants and total cyanide were below detection limits in both samples.

Water quality monitoring was also conducted in Truman Harbor along the inner Mole berths during the early 1980's as part of the Navy's Explosive Ordnance Detachment Marine Mammal program. During this period, water quality was found to be significantly better than that in the ship channel (Demes 2000).

In the Florida Keys, turbid waters occur naturally during periods of sustained high winds or high tidal currents. Waters become chalky or milky from fine-grained carbonate sediments suspended by water turbulence and may persist for more than a week (Little 1998; Sargent *et al.* 1995). Propeller wash from vessels with drafts that are deep relative to the depth of water also cause turbidity trails or plumes.

The FKNMS and FDEP have received multiple citizen complaints about cruise ships causing excessive turbidity during maneuvering in Key West Harbor (Barbera 1998, Causey 1998). FDEP has performed limited compliance sampling and has notified the City of Key West that cruise ship-generated turbidity may be a violation of state water quality standards; however, to date, FDEP has not taken enforcement action (Barbera 1998). Turbidity plumes created by propeller wash in Key West Harbor and the ship channel tend to disperse within several hours due to rapid tidal flushing through the area (Sandra Walters Consultant 1999).

Sediment

Sediments in Key West Harbor do not exhibit significant levels of metals or petroleum contamination, based on the analytical results of four sediment samples collected in 1999. Sediment collected between the Mole and the ship channel did not contain any measurable levels of polynuclear aromatic hydrocarbons (PAHs), petroleum range organic compounds, or volatile organic compounds

(VOCs). Metal concentrations were similar to those measured at control stations (Sandra Walters Consultant 1999).

No sediment quality data are available for Truman Harbor. Sediments in the harbor would likely have accumulated heavy metals, PAHs, and other pollutants from past Naval activities (e.g., vessel maintenance and repairs, refueling operations, discharge of industrial effluent). However, because the harbor has been dredged twice in the last 30 years, most recently in 1985, levels of sediment contamination are likely not commensurate with historical inputs to the harbor.

Groundwater

The Biscayne Aquifer (commonly referred to as the Surficial Aquifer), and the Floridan Aquifer (a confined artesian aquifer), are the two main aquifers that underlie the Florida Keys (EPA 1992). The Biscayne Aquifer is the primary system, and is considered one of the most productive and permeable in the world. However, because of its excessive chloride content in the Florida Keys, the Biscayne Aquifer is a nonpotable water source, although water from this aquifer is used for numerous other nonpotable water uses (EPA 1992). The City Engineer of Key West reports that some of these wells might be used for drinking water after treatment such as reverse osmosis (Fernandez 1998). The freshwater lens averages 5 feet (1.5 meters) below the center western half of Key West. The lens contains 20 to 30 million gallons (75.7 to 113.5 million liters) of freshwater depending on the season (U.S. Navy 1998).

3.4 Air Quality

The air quality in Key West is good, according to the FDEP (City of Key West 1997b). Although most pollutants are not routinely measured, the City of Key West estimates that most pollutant levels are unlikely to exceed one percent of the state or federal ambient air quality standards (U.S. Navy 1992). Air quality is expected to remain good to excellent due to regional air dispersion characteristics, the non-industrialized nature of the area, and the City's distance from major urban areas.

Most air pollution in Key West is caused by automobile emissions. Therefore, air quality degrades slightly during the peak tourist season (December through April) when automobile traffic increases. The only major point sources of air pollution are oil-burning electrical-generating units at Stock Island. No major sources of air pollution are located on the Truman Waterfront or any other NAS Key West property. Large naval vessels and cruise ships that frequent Key West do not generate sufficient pollution to affect local air quality (City of Key West 1997b; U.S. Navy 1992).

3.5 Environmental Contamination

A variety of hazardous materials were used at Truman Annex, including petroleum, oil and lubricants (POL) solvents and thinners, caustic cleaning compounds and surfactants, antifreeze, adhesives, acids, paints, and pesticides. The hazardous materials were principally used for ship support activities. A number of the hazardous waste sites have undergone investigation for suspected site contamination under the DoD's Installation Restoration Program (IRP), in compliance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for former waste sites (U.S. Navy 2000). Remedial actions have been selected by the Navy, in consultation with the EPA and FDEP and with input from the public, for each of the identified sites. The selected remedies for each site are discussed below. At sites where contaminated soil has been removed, it was replaced with clean fill to the existing grade.

Truman Annex DRMO Waste Storage Area

The Truman Annex Defense Reutilization and Marketing Office (DRMO) area includes buildings 795, 284, and 261 and two large, fenced storage areas known as the former Oil Container and Scrap Metal and Refugee Item Storage Area, collectively known as the DRMO Waste Storage Area. The DRMO primarily stored metal debris. In addition, motors, vehicles, and other equipment have been stored on site. Maps from the 1940's through 1950's indicated the presence of oil racks within the storage areas. In the recent past, Building 261 was used to store hazardous materials. Oil may have been spread over the area in the past to contain dust.

The selected remedy for the site known as the DRMO Waste Oil Container and Scrap Metal and Refugee Item Storage Area is to provide Land Use Controls (LUCs) because contamination at the site has been sufficiently remediated. In 1999, as part of an Interim Remedial Action (IRA), 12,000 cubic yards (yd³; 9,175 cubic meters [m³]) of contaminated soil were removed from the DRMO Waste Storage Area to a depth of 2 to 4 feet (0.6 to 1.2 meters) below ground surface (BGS). The soil removal activities were performed in accordance with the FDEP Brownfields Cleanup Criteria Rule, which provided a regulatory basis to determine engineering controls for the site. LUCs will include restrictions to ensure the integrity of the engineering controls, which are asphalt road surfaces (i.e., State Park Road). Cleanup is consistent with the proposed land uses of the Reuse Plan.

The area between buildings 261 and 284 required no further action because contamination at the site has been sufficiently remediated. An IRA performed at the site in 1999 removed approximately 300 yd³ (229 m³) of soil to a depth of 2 feet (0.6 meter) BGS. No chemicals of concern were detected above action levels in confirmation samples.

Truman Annex Former Location of Building 136

Building 136 was located on Truman Annex adjacent to the east quay. The area served as a ship repair, plate and mold shop since it was constructed in the early 1940's. The building was demolished in the mid-1990's and was partially removed for disposal with its concrete rubble buried on the original site.

The selected remedy for this site is to provide LUCs because contamination at the site had been sufficiently remediated. The IRA performed in 1999 at the site removed approximately 3,000 yd³ (2,294 m³) of contaminated soil to a depth of 2 feet (0.6 meter) BGS. Arsenic was detected above its action levels in one confirmation sample. However, the location of the sample is below an existing road, which provides an engineering control to limit possible exposure. The LUCs at the site include deed restrictions that require anyone who disturbs the permanent containment material to comply with all appropriate laws and regulations. Cleanup is consistent with the proposed land uses of the Reuse Plan.

Truman Annex Building 103

Truman Annex Building 103 is located near the east quay. Building 103 is the former central power plant and is still standing, but out of service. Hazardous materials, especially VOCs, semivolatile organic compounds (SVOCs), and inorganic compounds, are believed to have been used in the building. In addition, PCBs are known to have been present in transformers at Building 103. These transformers have been removed from the building in the mid-1980's.

The IRA performed in 1999 removed contaminated soil to depths ranging from 2 to 6 feet (0.6 to 1.8 meters) BGS at two different locations. A third location north of Building 103 will be remediated to remove contaminated soil.

Truman Annex Buildings 102 and 104

Truman Annex buildings 102 and 104 are located adjacent to the east quay on either side of Building 103. Building 102 was originally used to store torpedoes, and then after the submarine base closed, for general storage. Building 104 was used to service and store submarine batteries. The large tanks inside the building held acid used in submarine batteries. The site was used for the storage of hazardous materials and contains USTs.

The selected remedy for these sites was No Further Action because contamination at the sites has been sufficiently remediated. A total of 1,022 yd³ (781 m³) of contaminated soil were removed at the site in two different locations. No CERCLA-designated chemicals of concern were detected above their action levels.

Truman Annex Building 223, Former Hazardous Waste Management Storage Area

Building 223 functioned as a repair shop and storage area for port services. A closed hazardous waste storage area containing VOCs, SVOCs, and inorganic compounds was located immediately south of the building.

Further remedial action for this site is required. The IRA performed in 1999 at Building 223 removed approximately 62 yd³ (47 m³) of contaminated material. Arsenic in excess of the action level was left in place at two different locations beneath concrete foundations. Further excavations are scheduled to be performed by October 2000 to remove the concrete pads and contaminated soils.

Truman Annex Former Lube Area

The former lube area is located across the street from Building 223 just south of the entrance to Fort Zachary Taylor State Park. Fuels, solvents, metals and other petroleum products were stored at the former lube area.

No further remedial action is required at the site because the existing contamination has been sufficiently remediated. Approximately 62 yd³ (47 m³) of contaminated soils to a depth of 2 feet (0.6 meter) BGS were removed from the site in 1999.

3.6 Terrestrial Resources

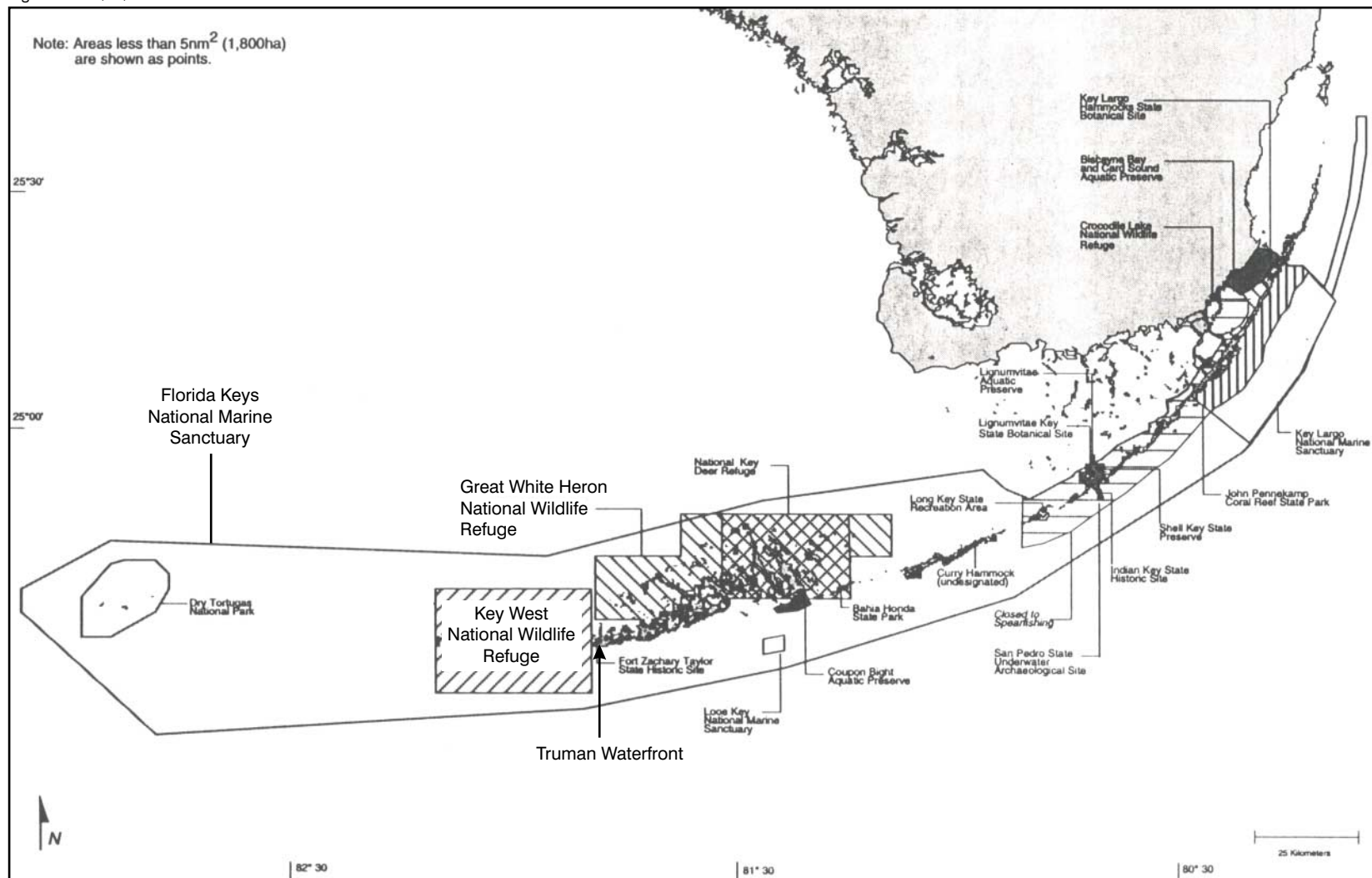
Vegetation

Maintained grass lawns and non-native vegetation cover nearly all of the pervious surfaces of the Truman Waterfront property. Only a scattering of trees are present on the property, most of which are Australian pines (*Casuarina equisetifolia*). Several species of trees on the property are protected by the City tree protection ordinance (Article XIV, City of Key West Land Development Regulations), including coconut palm (*Cocos nucifera*), mahogany (*Swietenia mahogani*), and strangler fig (*Ficus aurea*).

Wildlife

The Truman Waterfront is devoid of native terrestrial wildlife habitat. The most common wildlife are raccoons and birds. Lists of bird species common to NAS Key West and the Lower Florida Keys are contained in the City of Key West Comprehensive Plan (City of Key West 1993) and the Fish and Wildlife Section of the Natural Resources Plan for NAS Key West (U.S. Navy 1996).

Two national wildlife refuges are located near Key West (see Figure 3-2) and are often visited by boaters from Key West. The Key West National Wildlife Refuge (KWNWR) is located west of Key



SOURCE: E & E after U.S. Navy 1986.

© 2000 Ecology and Environment, Inc.

Figure 3-2 NATIONAL WILDLIFE REFUGES AND OTHER MANAGED AREAS IN THE VICINITY OF TRUMAN WATERFRONT

West, approximately 0.3 mile (0.5 km) from the Truman Waterfront. The southeastern corner of the Great White Heron National Wildlife Refuge is located approximately 3 miles (4.8 km) north of the Truman Waterfront. The refuges were established as preserves and breeding grounds for native birds and other wildlife. The KWNWR contains more than a dozen named keys within 12 miles (19.3 km) of Key West, including one privately owned island, Ballast Key. Within both refuges, the USFWS manages the federally-owned islands, as well as the state-owned submerged land under agreement with the state (USFWS and Florida Department of Natural Resources [FDNR] 1992).

Roosting, foraging, and nesting activities of birds within the refuges are susceptible to disturbance by motorized watercraft. Between 1979 and 1990, the number of boaters using the refuges increased dramatically in response to population and tourism growth in the Lower Keys, leading to increased human-wildlife interactions. Furthermore, the advent of shallow draft vessels, particularly personal watercraft (e.g., jetskis), during this period compounded the human disruption of wildlife habitats by enabling public access to previously inaccessible areas of the refuges. Consequently, in 1992 the USFWS and the State of Florida instituted a prohibition on use of personal watercraft, airboats, water skiing, and aircraft landing within both refuges, as well as establishment of idle speed, no motor, and no access buffer zones in appropriate areas for the protection of wildlife (USFWS and FDNR 1992).

Several islands in KWNWR, specifically Woman, Marquesas, Boca Grande, and Man keys, contain beaches that are used by nesting sea turtles, including the Atlantic Ridley (*Lepidochelys kempii*), Atlantic loggerhead (*Caretta caretta caretta*), Atlantic hawksbill (*Eretmochelys imbricata imbricata*), and Atlantic green (*Chelonia mydas*). Turtle nesting activities are susceptible to disturbance from boaters who camp and build campfires on these beaches (USFWS and FDNR 1992)

3.7 Marine Resources

Benthic Communities

An underwater survey of the nearshore areas of Truman Beach and the outer side of the Mole Pier was conducted by Ecology and Environment, Inc., (E & E) on May 3, 1998, to characterize the size and condition of nearshore seagrass beds and benthic communities. A band of discontinuous seagrass beds is located approximately 30 feet (9.1 meters) seaward of the southern half of the center Mole Pier. These seagrass beds contain turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium ilifforme*), and some shoal grass (*Halodule wrightii*). The seagrasses off Truman Beach are lush and relatively continuous. Seagrass beds offshore of the Mole Pier are less dense and discontinuous with coralline algae/coral rubble areas. The seagrass beds are generally located in a depth of 4 to 12 feet (1.2 to 3.7 meters), where the bottom slopes steeply to the bottom of the ship channel.

The five groins that extend westerly from the center of the Mole Pier are heavily covered with sponges and epiphytes, and holes in the sheet piling provide habitat for small fish. Coral rubble/sand areas surround the groins; areas between the three southernmost groins are exposed at low tide. Submerged concrete rubble near the junction of the Mole Pier and Truman Beach provides habitat for reef fish, spiny lobsters, sea urchins, and other reef inhabitants.

The entire shoreline of the Truman Waterfront is composed of hardened bulkheads, except for Truman Beach, a 200-foot- (61-meter-) long, calcareous sand beach at the base of the western side of the Mole Pier. The beach provides foraging habitat for shorebirds and nesting habitat for sea turtles. The bulkheads and adjacent concrete and steel debris along the interior perimeter of the basin are colonized with soft and hard corals, tunicates, sponges, and other reef-building organisms, which provide habitat for numerous species of fish and invertebrates. The harbor bottom consists of soft, silty sediments (see Section 3.2), inhabited by mollusks, polychaete worms and other burrowing invertebrates. Benthic sampling conducted in 1986 indicated that benthic faunal communities within Truman Harbor were less diverse and less productive than in the area adjacent to the center of the Mole Pier (U.S. Navy 1986). This difference was attributed to the higher flushing and colonization rates outside the harbor and also to the fact that portions of the harbor had been dredged only two to three months prior to sampling.

Commercial and Recreational Fisheries

Lobsters are known to inhabit a ledge that parallels the ship channel offshore of the Mole Pier. Recreational lobster fishermen dive along this ledge to harvest lobsters, primarily at the beginning of the lobster season (early August) when as many as 10 boats at a time anchor in the channel or drift along the shoreline (Little 1998).

Key West Harbor and the ship channel historically provided some of the best tarpon fishing in the Lower Florida Keys, attracting numerous recreational fishing boats during spring and summer. However, the number of tarpon coming through Key West Harbor has declined significantly in the past decade, with a corresponding decrease in the number of tarpon fishermen (Crusoe 1998).

Marine fish habitat in the Florida Keys is protected under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The MSFCMA requires federal agencies to consult with the National Marine Fisheries Service (NMFS) when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse impact on designated Essential Fish Habitat (EFH). EFH has been designated for more than 30 species of commercially and recreationally important fish and shellfish in the South Atlantic, including five species of shrimp, spiny lobster, red drum, 17 species of snappers and groupers, and coral species and coral reef communities. The FKNMS, which includes the waters of Key West Harbor, has been designated as a habitat area of

particular concern. Therefore, all subtidal and intertidal areas in the project area are considered EFH under the MSFCMA.

3.8 Threatened and Endangered Species

Three federally listed species are known to occur on or near the Truman Waterfront property (see Table 3-1). No critical habitat for any federally listed species has been designated on NAS Key West property.

Table 3-1			
THREATENED AND ENDANGERED SPECIES, AND SPECIES OF SPECIAL CONCERN TRUMAN WATERFRONT PROPERTY, NAS KEY WEST, FLORIDA			
Scientific Name	Common Name	Status	
		USFWS	FFWCC
Birds			
<i>Sterna antillarum</i>	Least tern	--	T
<i>Sterna dougalli dougalli</i>	Roseate tern	T	T
<i>Pandion haliaetus</i>	Osprey	--	SSC
Reptiles			
<i>Caretta caretta caretta</i>	Loggerhead sea turtle	T	T
Mammals			
<i>Trichechus manatus latirostris</i>	West Indian manatee	E	E

Source: U.S. Navy 1996.

Key:

E = Endangered
 SSC = Species of Special Concern
 T = Threatened

FFWCC = Florida Fish and Wildlife Conservation Commission
 USFWS = United States Fish and Wildlife Service

The Florida manatee (*Trichechus manatus*) is a subspecies of the West Indian manatee, which is a federal and state endangered species. Manatees have been sighted in Key West Harbor as well as other waters around the island. Although manatees may occur in the Keys throughout the year, state-wide surveys have found a maximum of six manatees in the Lower Keys at any one time, but most of the time only one or two individuals are present (Ackerman 1997, cited in United States Air Force [USAF] 1998). Abundant seagrass beds in the Lower Keys provide good foraging habitat for manatees, but the lack of

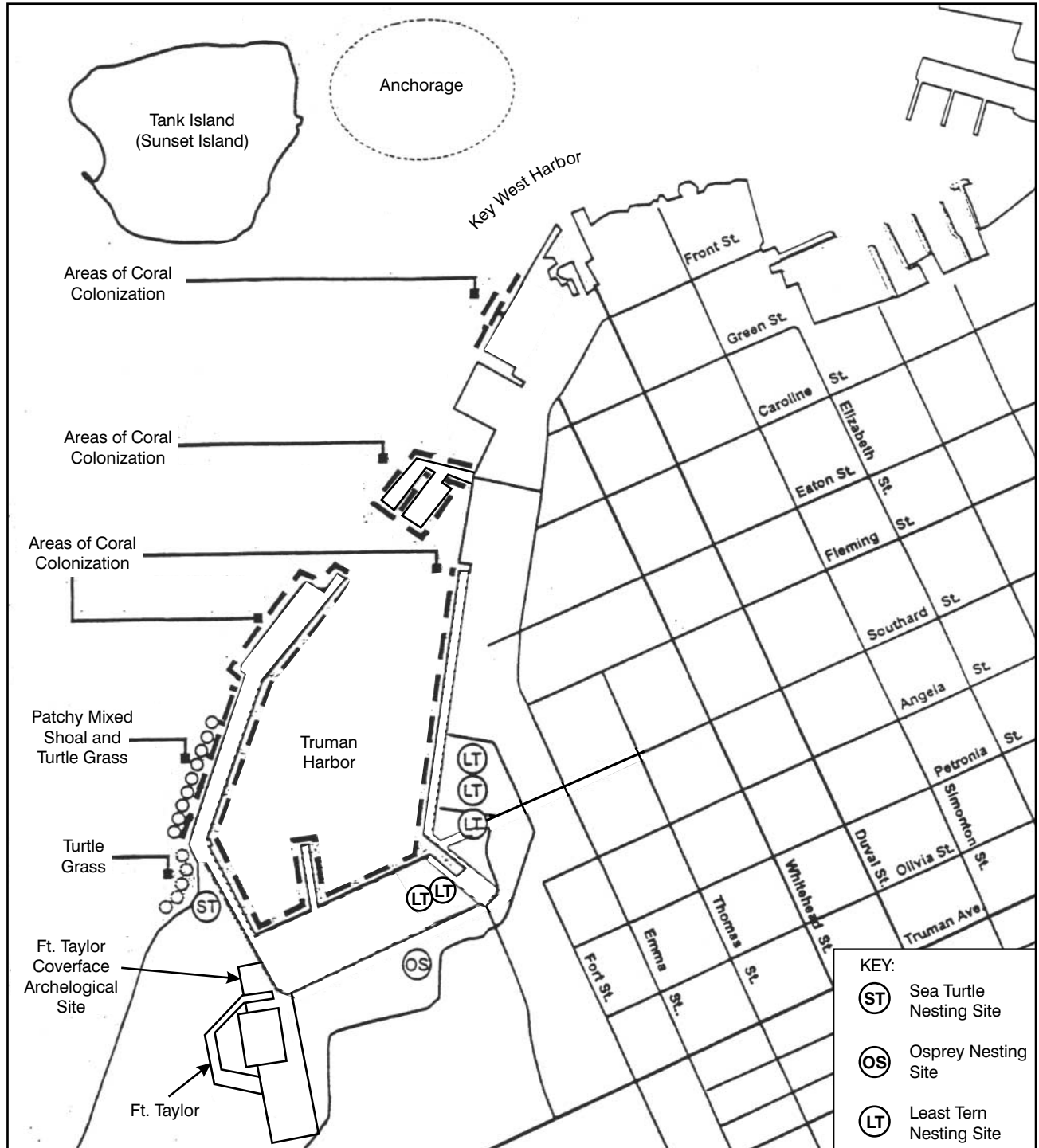
fresh water is likely the main factor limiting their occurrence in the area (Florida Natural Areas Inventory [FNAI] and The Nature Conservancy [TNC] 1994).

The greatest chronic threat to Florida manatees is accidental mortality due to collisions with boats (Humphrey 1992). No manatee deaths have been recorded in the vicinity of Key West (City of Key West 1993). Destruction and/or alteration of seagrass beds, the species' habitat, also has been implicated in the population's decline in Florida. The amount of boat use in manatee habitat has increased rapidly in Florida, creating substantial disturbance to their habitat (e.g., scarring of seagrass beds) as well as greater potential for injury and death (Humphrey 1992; Sargent *et al.* 1995).

Five species of sea turtles occur throughout the marine waters of the Keys. The Atlantic loggerhead is the most common sea turtle in the Keys and the only species that regularly uses the Keys' beaches for nesting (NOAA 1996). Truman Beach and adjacent beaches on Fort Zachary Taylor State Park provide good potential nesting habitat for sea turtles (see Figure 3-3). One loggerhead sea turtle nest was confirmed on Truman Beach adjacent to the Mole Pier in 1991; another unconfirmed nest was reported in 1989 (U.S. Navy 1996). The most common threats to sea turtles include shrimp trawl drownings, destruction of nesting beaches by coastal development, artificial lights near nesting beaches (which cause hatchlings to migrate away from their ocean destination), ingestion of marine debris and tar balls, entanglement in fishing gear, water quality degradation, and collisions with vessels (NOAA 1996).

Colonies of least terns (*Sterna antillarum*) nest annually on the roofs of five buildings on the Truman Waterfront property (buildings 102, 103, 104, 112, and 113), as well as seven other buildings located at Truman Annex (Schuetz 1998; see Figure 3-3). Least terns typically nest on beaches, open sandy or graveled areas, and flat-topped, gravel roofs, but they are opportunistic and have been known to nest on dredge spoil, highway easements, rock pits, roadside shoulders, and parking lots (U.S. Navy 1996; NOAA 1996). Approximately 75% of terns nesting in the Lower Florida Keys nest on roofs. The terns prefer the rooftops with the most gravel and no overhanging tree limbs, which can provide access to predators (primarily raccoons). In recent years, few terns have nested on tops of buildings 102, 103, and 104 due to the paucity of gravel. The terns typically nest from mid-April to late August (U.S. Navy 1996; Shuetz 1998). In April 1998, 25 least terns were accidentally killed at Truman Annex during reroofing of several buildings. These least terns were entrapped and died when they alighted on wet shingle mastic that failed to dry rapidly.

Roseate terns (*Sterna dougallii dougallii*) sometimes nest with least terns, but prefer shell/sand beaches, broken coral heaps, and eroded limestone in open or sparsely vegetated areas (NOAA 1996). Roseate terns have been reported from Sunset (formerly Tank) Island and Wisteria Island (two spoil islands in Key West Harbor) and Molasses Reef Dry Rocks (NOAA 1996). At NAS Key West, roseate terns are known to nest on rooftops, usually with the largest least tern nesting colonies (U.S. Navy 1996,



SOURCE: E & E after U.S. Navy 1986.

© 2000 Ecology and Environment, Inc.

Figure 3-3 NATURAL AND CULTURAL RESOURCES AT TRUMAN WATERFRONT

Schuetz 1998). Threats to the least and roseate tern populations include loss of suitable nesting sites due to development, disturbance of nest sites by humans, and predation of eggs by raccoons and black rats (NOAA 1996). Although rooftops may provide some isolation from human disturbance and predators, they may present other potential hazards, including flooding (common on flat roofs) and falls by young that cannot fly (NOAA 1996).

The osprey (*Pandion haliaetus*) is designated as a State Species of Special Concern only in Monroe County. Ospreys are known to nest on Truman Annex; an active nest is located approximately 300 feet (91 meters) south of Truman Waterfront (see Figure 3-3). Ospreys nesting on poles or platforms next to roads or residences are habituated to vehicular traffic and other human activities. However, ospreys that nest in mangroves on uninhabited, backcountry islands in the Lower Keys (primarily within the two national wildlife refuges) are substantially less tolerant of human disturbance. Ospreys in these areas commonly nest less than 4 feet (1.2 meters) above normal high tide and are easily disturbed by boaters. Some of the lowest nests can be overwashed at high tide by boat and personal watercraft wakes. Frequent and prolonged human disturbance in these backcountry habitats can lead to nest abandonment or otherwise negatively affect reproductive success of ospreys (USFWS and FDNR 1992).

3.9 Cultural Resources

3.9.1 History of the Property

The Mole Pier was constructed during World War I to create a protected basin for submarines. The remainder of the Truman Annex property was created by the Navy during World War II from approximately 5.5 million yd³ (4.2 million m³) of fill material. This was the last major filling episode in Key West, except for the addition of land in front of Fort Zachary Taylor and the creation of Dredgers Key (now called Sigsbee Park) during the late 1950's (Mickler 1945; Brockington and Associates 1997).

More than 14,000 ships came into Key West during the period of World War II. The Naval Station's Industrial Department conducted approximately 7,160 ship repairs, including drydocking more than 1,700 vessels. (These activities occurred either on or adjacent to the Truman Waterfront property.) At times during World War II, more than 15,000 Naval personnel were ashore in Key West. At its peak, the Naval Operating Base employed 3,400 civilian workers (Mickler 1945).

During the period of 1978 to the mid-1980's, commercial vessels and liveaboard boats were docked or anchored in Truman Harbor. In 1983, boats from the Mariel (Cuban) boat lift were also moored in the harbor. Cruise ships started making port calls in Key West in the 1960's, gradually increasing through the 1990's, with the first use of the Mole Pier for cruise ship docking in 1995.

3.9.2 Surveys of Archaeological and Historical Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their actions on historic and prehistoric properties. Responding to this requirement, surveys of archeological and historic resources were conducted at NAS Key West in the mid-1990's. *An Architectural Inventory - Naval Air Station Key West, Key West, Florida*, (hereafter, the inventory) was completed by the United States Army Corps of Engineers (USACE), Mobile District, in 1995, and *Archaeological Survey of Key West Naval Air Station, Monroe County, Florida*, (hereafter, the survey) was completed by Brockington and Associates, Inc., in 1997.

The purpose of the archaeological survey was to identify and locate all prehistoric and historic archaeological sites on government-owned lands at NAS Key West and to evaluate them to determine their eligibility for listing on the National Register of Historic Places (NRHP). This survey was conducted in compliance with Section 110 of the NHPA.

Fort Zachary Taylor, a Civil War-era Fort listed on the NRHP, is located directly adjacent to the southwest boundary of the Truman Waterfront property (see Figure 3-3). The Fort, listed as Site 8MO206 by the State Historic Preservation Office (SHPO), is located on state property contiguous with the western boundary of Truman Annex.

The survey identified one area on the Truman Waterfront property with a high potential for containing significant intact archaeological deposits. This site, located adjacent to the east side of Fort Zachary Taylor, consists of a sand coverface (an earthen cover over the brick face of the Fort) constructed on the landward side of the Fort during the Civil War to help protect the Fort (Figure 3-3). The coverface has been completely filled over and is entirely within Navy property. The limited archaeological survey did not locate any intact archaeological deposits or features in the coverface area, but archival information indicates that a nineteenth century military midden debris may be present below the surface of the coverface. Therefore, as a result of this investigation, the boundary of Site 8MO206 was expanded to incorporate the subsurface coverface area. The boundary of the site includes approximately 4 acres (1.6 ha) of the Truman Waterfront property.

Whitehead Spit, another site with high archaeological potential, was identified within Truman Annex approximately 2,000 feet (656 meters) south of the Truman Waterfront boundary. Although no subsurface archaeological investigations were conducted at this site because of the potential presence of hazardous materials, two 8-inch (20.3-centimeter) cannonballs were discovered during previous excavations of the area as part of clean-up efforts. These finds support archival evidence that this area has high potential for nineteenth century archaeological deposits.

The remainder of the Truman Annex, including the Truman Waterfront property, is considered to have very low potential for containing significant intact archaeological deposits due to the extensive filling that created the land (Brockington and Associates 1997).

The architectural inventory located and evaluated all buildings and structures built prior to 1947 and/or associated with major historical Cold War-era events to determine their eligibility for listing on the NRHP. The inventory identified 14 historic buildings or structures. The Reuse Plan states that, based on the findings of the architectural inventory, two of the buildings/structures located on the Truman Waterfront property are considered eligible for listing on the NRHP: the Seminole Battery and Underground Bunker (Building 283) and the Old Quay Wall (City of Key West 1997a). The Seminole Battery was constructed as part of Fort Zachary Taylor in 1889 in response to the Spanish-American War. The Underground Bunker is believed to have been designated a fallout shelter and/or command center bunker during the Cuban Missile Crisis. The Old Quay Wall is a seawall that is believed to have marked the shoreline at the time it was built at the turn of the century (City of Key West 1997a).

However, according to the Navy, the Old Quay Wall is located south (outside) of the Truman Waterfront property boundary (Davis 1998). Furthermore, the Seminole Battery property (approximately 3.46 acres [1.4 ha]) was removed in 1999 from the surplus property designation. Therefore, no buildings or structures on the property to be conveyed are considered NRHP-eligible.

3.10 Socioeconomics

3.10.1 Population and Demographics

Population

As of fiscal year 1998, 1,357 active-duty military personnel, including 160 officers and 1,197 enlisted personnel, were stationed at NAS Key West. In addition, 830 civilians and 361 contractor personnel were employed full-time at the station. Total Navy population in Key West has fluctuated over the past 12 years, and has decreased considerably since 1992/1993, from 4,543 full-time personnel to the 1998 fiscal year population of 2,548. This population decrease is primarily associated with the departure of several aircraft squadrons from the NAS.

The resident population of the City of Key West was 24,832 in 1990 (U.S. Bureau of Census, 1990). However, as noted in the 1997 City of Key West Comprehensive Plan Evaluation and Appraisal Report (City of Key West 1997b), estimation and projection of the Key West resident population is a more difficult task than for most other small cities because of two major factors:

- The City is located on an island that is largely built out, with little available space remaining that is suitable for development; and

- The City and Monroe County have adopted ROGOs that restrict the number of building permits that can be issued for construction of new dwelling units (see Section 3.10.3).

Given the above constraints to development, the City's consultant that prepared the City of Key West Comprehensive Plan Evaluation and Appraisal Report used a "holding capacity" population projection methodology (City of Key West 1997b). This methodology takes into account that future resident populations will mainly be living in housing units that already exist. The ROGO growth cap from 1996 through 2002 does allow the construction of a limited number of housing units, and beyond this date there are no plans for allowing additional housing units in the City. Consequently, the holding capacity population projection model indicates a slight increase of the permanent resident population through 2002 to 26,657, followed by a flat population growth trend into the years beyond (see Table 3-2). Under this model, a housing unit occupancy rate of 85.3% and a population per household of 2.31 persons were observed from 1990 Census data and carried through the model. Growth cap housing units were assumed to be occupied at a rate of 91% per year through 2002.

In addition to the permanent resident population of the City of Key West, seasonal resident/household populations and overnight tourists comprise a significant portion of the total population of the City on any given day, and particularly during winter and early spring months.

The average daily seasonal visitor population for Key West, combining seasonal residents and overnight tourists, was estimated to be 12,887 in 1990, and is projected at 13,382 in 2000, and at 13,916 in 2010 (City of Key West 1993).

Table 3-2 HOLDING CAPACITY PERMANENT POPULATION PROJECTIONS FOR THE CITY OF KEY WEST						
Year	1990	1996	2002	2005	2010	2015
Permanent Population	24,832	25,581	26,657	26,657	26,657	26,657

Source: U.S. Bureau of Census 1990, City of Key West Comprehensive Plan Evaluation and Appraisal Report (City of Key West 1997b).

Note: The 1990 population number is from the U.S. Census. Population projections for 1996 through 2015 were developed with consideration of growth cap housing unit limitations imposed by the City rate of growth ordinance; and assumptions for a continued 85.3% housing occupancy rate (as observed from the 1990 Census), and a population per household of 2.31. Growth cap housing units were assumed to be occupied at a rate of 91% per year through the year 2002 (see text).

Demographics

According to the 1990 Census, 10.4% of the City's population is black, and 86.1% is white (see Table 3-3). The black population is more concentrated in the Bahama Village neighborhood, which is an approximately 22-block area in the Old Town sector adjacent to the Navy's Truman Annex. The City of Key West Bahama Village Redevelopment Plan (1995) estimated that 40% of the Key West black population resides in Bahama Village, where the racial distribution is estimated as 64.4% black, 34.5% white and 1.1% of other racial origins. This contrasts to the remainder of the City, where the distribution by race was estimated at 5.8% black, 90.4% white and 3.8% of other racial origins (City of Key West 1995).

Table 3-3										
MINORITY AND LOW-INCOME RESIDENTS IN KEY WEST, FLORIDA										
Location (Census Tract No.)	Total Residents	White		Black		Other		All Minorities Combined		Percent of Residents Considered Below Poverty Level
		%	No.	%	No.	%	No.	%	No.	
9719	4,362	91	3,952	5	234	4	176	9	355	8
9720	2,956	94	2,765	3	87	3	104	6	271	9
9721	5,863	87	5,125	7	428	5	312	12	356	6
9721.99	74	83	63	11	0	7	9	18	0	0
9722	2,924	94	2,730	4	122	3	72	6	323	11
9723	2,636	93	2,578	4	21	3	101	7	226	9
9724	3,429	55	1,666	44	1,592	1	35	4	657	19
9725	1,394	90	1,335	6	56	4	55	10	87	6
9725.99	37	89	48	11	0	0	0	11	0	0
9726	1,157	96	1,099	2	44	3	23	4	232	20
Total	24,832	86	21,361	10	2,584	4	887	14	2,507	10

Source: U.S. Bureau of the Census, 1990.

Note: Census Tract #9724 includes Bahama Village, as well as additional area comprised of non-minority neighborhoods. Therefore, the percent minority of Census Tract #9724 does not correspond to that cited in the text, which is specific to Bahama Village.

Census data for 1980 and 1990 indicate an increase in median age of Key West residents from 31 to 33.7. The Bureau of Economic and Business Research, University of Florida (BEBR) projections indicate the median age will continue to rise through the year 2000, when it is projected to be 38.1. School age populations, as a percentage of total population, decreased from 1980 to 1990, but are projected to remain relatively stable through 2000. Elderly populations increased slightly from 1980 to 1990, as a percentage of total population, but are projected to remain relatively stable through 2000.

3.10.2 Economy, Employment, and Income

Economy

During the period of 1830 to 1930, the Key West economy was represented by a diverse set of activities that included the U.S. Navy, fishing, shipwreck salvage, sponging, and cigar manufacturing. In the decades that have followed, the economy has been driven by Navy expenditures, tourism, and development. Recently, tourism is the most critical element in the economy of the City, with a significant contribution from government services, although the military contribution has become less of a factor in the dynamic of the local economy (City of Key West 1997a).

In a one-year period during 1995 and 1996, it is estimated that there were approximately 2.54 million tourist visits to the Keys, and 1.4 million of these tourist visits included time spent in Key West. The average length of stay was 5.2 days (Leeworthy and Bowker 1996). An assessment of the economic contribution of tourism to the Monroe County economy for the period of June 1995 through May 1996 estimated that \$1.334 billion (or 61%) of the total \$2.203 billion economic output (i.e., sales) of the county was attributed to tourism. Income from tourism in Monroe County was estimated as being \$506 million (or 45%) of the reported \$1.124 billion income in the county. These figures include the direct contribution of tourist spending, as well as the indirect and induced effect it had upon the local economy (English *et al.* 1996).

The economic output of Monroe County increased by 27.6% between 1989 and 1996 and income increased by 29.2% during the same period (U.S. Department of Commerce 1996).

There are many retired persons residing in Monroe County who receive income in the form of retirement pensions, investment dividends and interest, and social security, which represents a base of income that is independent of employment. As this income arrives in the local economy, there is demand for local goods and services, in turn creating local employment and income. Inter-county commuters also contribute to this effect, as a significant number of people live in Monroe County and commute to their jobs outside of the community, as well as non-residents who commute into Monroe County to their jobs. In 1994, there were 2,172 residents working outside the county and 2,046 non-residents working inside

the county, and the net difference in these transfers brought \$67 million into Monroe County (English *et al.* 1996).

The Florida Price Level Index has ranked Monroe County as having the most expensive cost of living among Florida's 67 counties in 1997 (Florida Department of Labor and Employment Security 1998). Although Monroe County is more expensive relative to most counties, with respect to food, apparel, transportation and health, recreation and personal services, the high cost of housing is the driving force behind the county's number one price level index ranking throughout the 1990's.

Employment

According to the Florida Department of Labor and Employment Security, the Monroe County labor force was 47,180 in February 1998. Included in the Monroe County total, the Key West labor force was 15,190 during this same period. In February 1998, the unemployment rate for both Monroe County and Key West was 2.7%. During this period, the unemployment rate for Florida and the United States was 4.4 and 5.0%, respectively.

The Key West unemployment rate decreased during the period of 1993 through 1997, with a high rate of 5.3% in January 1993 to a low of 2.0% in July 1997. The Key West unemployment rate has not been above 2.8% since February 1996. While Key West's unemployment has remained low, high demand for workers in the private sector has grown steadily. The population of the employed wage labor force in Key West was an average of 13,861 (employed persons per month) in 1996 and 14,253 in 1997. For the first quarter of 1998, the employed wage labor force in Key West was an average of 14,792 persons (Florida Department of Labor and Employment Security 1998).

The largest entities providing employment in Key West are companies providing lodging and recreational activities to tourists; federal, state and local government entities and regional authorities; and a regional health care provider (Key West Chamber of Commerce undated; City of Key West 1997a). Table 3-4 shows the wage employment profile for Key West in years 1990 and 1995. The distribution of wage employment across general employment sectors is proportionally similar to Monroe County, and the major growth sectors for wage employment are in the retail and services sectors.

In 1994, proprietor employment was found to be 21.7% of the 46,784 total employment in Monroe County. Compared to proprietor employment rates of 14.9% in Florida and 15.5% in the U.S., the high proportion of proprietor employment in the county reflects the dominance of small businesses in the tourist industry (English *et al.* 1996).

<p style="text-align: center;">Table 3-4</p> <p style="text-align: center;">WAGE EMPLOYMENT PROFILE FOR THE CITY OF KEY WEST</p> <p style="text-align: center;">IN 1990 AND 1995</p>				
Industry	1990	1995	Average Annual Change	Average Annual Percent Change
Agriculture	296	359	13	4.3
Construction	865	1,002	27	3.2
Manufacturing	365	314	(10)	(2.8)
Transportation Equipment	36	46	2	5.0
Transportation, Communications and Utilities	903	893	(2)	(0.2)
Wholesale Trade	240	278	8	3.2
Retail Trade	3,771	4,273	100	2.7
Finance, Insurance and Real Estate	718	749	6	0.9
Services	4,176	4,673	99	2.4
Federal Government	819	808	(2)	(0.3)
State Government	476	556	16	3.3
Local Government	1,248	1,257	2	.01
Total	13,913	15,206	259	1.9

Note: The statistics for the Federal government do not include the total military population employed in Key West.

Source: Key West Base Reuse Plan, Appendix 2, Socioeconomic Profile of Key West, Table III-11 (City of Key West, 1997a).

The seasonal cycle of tourism activity during the course of a year in Monroe County has an effect on economic activity and employment. However, the general decrease in employment that occurs in late spring and continues to the beginning of tourist season in late autumn, has not, in recent years, reached levels that are considered extreme. English *et al.* observed that over a four-year period between 1989 and 1992, 1990 had the highest seasonal change in non-proprietor. In that year, employment was at its highest in March (32,040), and lowest in October (29,209), which was an 8.8% change. The relatively low degree of change was surmised to be related to the dampening affect that transfer payments (i.e., retirement income) have on the seasonal economic cycle.

Income

Between 1994 and 1996, per capita personal income rose 6.6%, to \$28,759, in Monroe County. During the same three-year period, Florida per capita personal income rose 6.3% to \$24,198, and the United States per capita personal income rose 5.6% to \$24,436. (U.S. Department of Commerce, Bureau of Economic Analysis 1998).

Median household income in Key West increased from \$28,121 in 1989, to \$34,299 in 1996, an increase of 22%. Monroe County median household income increased 29% over the same period, from \$29,351 to approximately \$38,000. Florida household income increased 24%, to approximately \$34,000 over this period (U.S. Department of Commerce 1990; City of Key West 1997a).

As shown on Table 3-5, a dramatic shift occurred in the household income range distribution in Key West during the seven-year period of 1989 through 1995. There was a 10% decrease in the number of households earning less than \$35,000, while there was a marked increase in the number of households (447) with incomes in the \$50,000 to \$75,000 range. The most striking change, however, is the 244% increase in households with incomes exceeding \$150,000. These shifts attest to the affluence that is now more present in the community (City of Key West 1997a).

<p>Table 3-5</p> <p>HOUSEHOLD INCOME</p> <p>CITY OF KEY WEST</p>				
Income Range	1990 Census 1989	Estimated 1995	Total Change	Percent Change
Less than \$15,000	2,246	1,945	(301)	(13)
\$15,000 to \$25,000	2,241	2,086	(155)	(7)
\$25,000 to \$35,000	1,970	1,796	(174)	(9)
\$35,000 to \$50,000	1,854	2,009	155	8
\$50,000 to \$75,000	1,352	1,799	447	33
\$75,000 to \$100,000	363	559	196	54
\$100,000 to \$150,000	233	440	207	89
Greater than \$150,000	166	571	405	244
Total	10,425	11,205	780	7

Source: Key West Base Reuse Plan, Appendix 2, Socioeconomic Profile of Key West, Table III-10, (City of Key West 1997a).

3.10.3 Housing

The total number of housing units in the City of Key West in 1990 was 12,221, increasing from 10,866 in 1980. During this period, the number of households occupied by families declined from 63% to 55%, while the number of households occupied by one person or more non-related persons increased from 37% to 45%. Homeowner occupancy declined between 1980 and 1990, from 42% in 1980 to 35.9% in 1990, while rental occupancy has increased from 42.7% to 49.4% (U.S. Bureau of Census 1980, 1990)

The average price of a single-family home in Key West increased from \$188,750 in 1994 to \$244,000 as of May 1997 (City of Key West 1997a). Rental housing in Key West is also very expensive,

ranging from \$750 to \$1,750, on average. In 1997, the National Association of Realtors ranked Key West as the fourth most expensive housing market in the United States (City of Key West 1997a).

There are 886 publicly subsidized rental units in Key West managed by the Key West Housing Authority. In 1998, the Housing Authority had a waiting list of 125 applicants for public housing. Private developments that are considered affordable housing include Ocean Walk (63 units), Mariners Cove (78 units), and Stock Island Apartments (129 units).

The City of Key West has attracted affluent homeowners, comprised of retirees and seasonal or “second home” buyers. This in-migration of homeowners, coupled with the virtual moratorium on housing development, has significantly contributed to the increase in housing prices in Key West. Similarly, the rental housing market for permanent residents is being displaced by the conversion of large homes, accessory units, and housing complexes to transient lodging for seasonal visitors who are willing to pay higher rents or fees.

Due to these circumstances, many permanent residents of Key West are unable to afford housing, resulting in economic hardship and overcrowding. In 1995, approximately 40% of the households in the City were considered cost burdened (i.e., more than 30% of the household income is used for rent or mortgage and utilities; Shimberg Center 1998). Table 3-6 shows the 1995 estimated need for affordable housing in the City of Key West, with projections of affordable housing needs for the years 2000 and 2010.

Table 3-6					
DEFICIT OF AFFORDABLE OCCUPIED HOUSING UNITS IN KEY WEST, 1995-2010					
Year	Total Households Projected	Deficit of Owner-Occupied Units	Deficit of Renter Occupied Units	Total Unit Deficit	Percent Deficit of Total Occupied Households
1995	11,309	5,246	918	6,164	55%
2000	11,664	5,483	1,137	6,620	57%
2010	12,065	5,928	1,297	7,225	60%

Source: Shimberg Center 1998.

In 1993, the City of Key West passed a number of ordinances to establish a building permit allocation system. The ordinances are commonly referred to as ROGOs. The purpose of the ordinances was to establish the existing number of residential units and transient units that could be built within the City limits over a certain time period. As of February 2000, the City of Key West had a total of only 40

units (33 single-family units, 0 multi-family units [waiting list], and 7 accessory units) available under the ROGO program through the time period 2000-2002 (Tucker 2000), indicating that residential growth in Key West is severely constrained by ROGO.

3.10.4 Taxes and Revenues

The City of Key West budget for fiscal year 1997/1998 was \$88,316,266. This figure included the General Fund Budget of \$22,407,382 and 13 activity funds totaling \$65,908,884.

The General Fund Budget expenditures are distributed largely to law enforcement (27%), fire department (17.6%), general government (11.0%), public works (8.2%), and expenses associated with berthing of cruise ships (7.1%). Lesser allocations are distributed over numerous other government administrative functions and services.

The primary revenue source for the General Fund Budget is *ad valorem* taxes, which are levied by the City at a millage rate of 3.7220. Key West has a taxable property value of \$2.162 billion, and the *ad valorem* millage generates \$7.70 million. Key West property values have risen dramatically over the past several years, necessitating a “rollback” of the *ad valorem* millage. In 1997, Key West property values increased 14.5%, and the *ad valorem* millage was rolled back at a corresponding percentage in order to avoid an increase in taxes from property owners. Since 1988, the sharp increase in property values has resulted in a roll back from 6.040 to the current rate of 3.7220.

Other sources of revenue to the General Fund Budget include intergovernmental revenue, charges for services (including cruise ship passenger disembarkation fees), license and permit fees, fines and forfeitures, and other sources.

Cruise ship disembarkation fees have increased in recent years to comprise a significant source of General Budget Fund revenues for the City of Key West. Prior to the City’s obtaining a license from the Navy for berthing of cruise ships at the Mole Pier at Truman Annex, City revenues from cruise ship disembarkation were \$850,058 in fiscal year 1994/1995. In the City’s General Budget Fund for fiscal year 1997/1998, disembarkation fee revenues were budgeted at \$2.7 million. In March 1998, the City of Key West Port Director projected that scheduled cruise ship calls to the City for fiscal year 1998/1999 would generate \$3.81 million in disembarkation fee revenues, of which \$2.42 million would be generated from use of the Mole Pier, and the remainder from the berthing areas at Mallory Square and Pier B (Hamlin 1998).

In addition to the General Budget Fund, the City maintains 13 activity funds that each serve specific purposes. For fiscal year 1997/1998, the largest of these funds were the sewer fund (\$29 million) and the solid waste fund (\$11.8 million).

3.11 Land Use and Development

3.11.1 Key West Land Use

Key West incorporates approximately 3,273 acres (1,309 ha), of which very little is available for development. As of 1997, only about 1.7% (47 acres [19 ha]) of Key West was considered vacant and developable; however, this does not include military property that may become available. Another 0.3% was vacant with development approval. The most common land use in the City is residential, occupying approximately 763 acres (305 ha), or 27.6% of the area. Behind institutional land uses, military property is the third most common land use activity at 415.5 acres (166.2 ha), or 15% of the land area (City of Key West 1997b).

The 1993 City of Key West Comprehensive Plan divides the City into six planning areas: Old Town, Central Residential, Northern Commercial, Ponds, North Stock Island and Military lands. The Old Town planning area surrounds the U.S. Naval Station Truman Annex property. Important planning components of Old Town are Duval Street, Key West Bight, Bahama Village, Truman Annex Development (private development) and Fort Zachary Taylor.

3.11.2 Existing Land Use

Site Description and Land Use

The Truman Waterfront surplus property consists of approximately 41.44 acres (16.6 ha) of land. Although historically this property was a hub of Navy waterfront activity, the site has been virtually vacant for the last 10 years. The entire area consists mostly of vacant land, several vacant structures, and maritime-related facilities. Mole Pier has an upland area of 7.6 acres (3 ha) of which 4 acres (1.6 ha) are comprised of the pier. There are two buildings totaling 1,679 ft² (156 m²) on the base of the pier. The northernmost section of the Mole Pier fronts along a 34-foot (10.3-meter) deep-water federally maintained ship channel. Use of the southern portion of the Mole Pier is restricted by a series of groins and sand shoals which transition into seagrass beds. The bulkhead shoreline along the interior basin fronts a 32-foot (9-meter) deep-water harbor, which connects to the 34-foot (10.3-meter) ship channel. The Mole Pier underwent major renovations in 1986 as part of improvements made by Navy to ready the site for a surface attack fleet, a plan that was later tabled. Mole Pier is both a breakwater and berthing wharf and contains electric distribution, sanitary sewer, wastewater, telephone utility lines, as well as street lighting. There has also been a major renovation to the eastern quay. Remaining maritime-related structures are in various stages of dilapidation.

Main activities at the site include berthing of cruise ships and military vessels. The City has a license with the Navy to provide berthing of cruise ships at the outer Mole berth. Berthing uses have also

been granted to the inner Mole berths, various entities for use of Pier 8, east quay, and west quay. The Naval Air Station's spill response team and Truman Annex-based fire department operate from Building 149. In addition, access to Fort Zachary Taylor State Park is through the site.

The submerged land within Truman Harbor is state-owned and is leased to the Navy through a lease agreement that expires in 2007.

Surrounding Land Use

The Truman Waterfront property is bounded by four distinctive land use areas: Truman Annex Planned Unit Development, Bahama Village, Fort Zachary Taylor, and NAS Key West Truman Annex (see Figure 1-2).

Truman Annex Planned Unit Development

The northeast portion of the site abuts the Truman Annex planned unit development, a gated community. This is a private, mixed-use development of mainly single-family residential units built in the late 1980's on previously excessed Navy property. Many of the property owners are seasonal residents or use their property as vacation homes. Wide streets, lined by sidewalks and white picket fences, are prevalent in the development. While public vehicular access to the development is limited to Front and Southard Streets, pedestrian and bicycle traffic may access the site from Whitehead Street. Overall, the Truman Annex planned unit development is isolated from the Truman Waterfront by a fence.

Bahama Village

Bahama Village is a 22-block area east of the Truman Waterfront property with a unique cultural identity and history of over 150 years, since Bahamians first emigrated to Key West. The area is comprised of single-family homes, blocks of multi-family homes and public housing. Private single-family dwellings occupy the largest amount of area. Non-residential uses, such as neighborhood commercial shops, personal service establishments, recreation facilities, and churches, are generally concentrated along Petronia Street. There are no industrial activities in Bahama Village. Most people residing in Bahama Village are year-round residents.

Nearly all of Bahama Village is within the National Register District as identified in the City's Comprehensive Plan; however, all of the neighborhood is protected as an historic zoning district. Approximately 75% of the Bahama Village structures located within the historic district retain their historic character and are considered contributing structures within the historic district (City of Key West 1995). Bahama Village is isolated from the Truman Waterfront property by a fence.

Fort Zachary Taylor

Fort Zachary Taylor State Park is directly west of the site. The Fort, constructed to protect Key West during the Mexican War, and later controlled by the Union army during the Civil War, is a National Historic Place and appears on the NRHP. The park includes the historical Fort, a beach, picnic areas, and public restrooms.

NAS Key West Truman Annex

The Truman Annex property (also referred to as the "Joint Interagency Task Force East [JIATF East] Compound") is to the south and west of the surplus Truman Waterfront property. The property is headquarters for JIATF East and provides support facilities, such as military family housing and Barracks for all NAS Key West tenant commands, as well as facilities to support various military missions that visit Key West.

3.11.3 Relevant Plans and Future Actions

Relevant plans and future actions potentially affecting the Truman Waterfront property include the Bahama Village Redevelopment Plan and the U.S. Navy's future actions at NAS Key West Truman Annex.

Bahama Village Redevelopment Plan

The 1998 Bahama Village Redevelopment Plan (1998 Plan) recognizes, through its goals, objectives, and policies, the long-term importance to the community of the Truman Waterfront site (City of Key West 1998). The 1998 Plan was developed in consideration of the Base Reuse Plan and recommends and encourages actions that integrate Bahama Village physically and economically into the Truman Waterfront site. According to the 1998 Plan, physical integration will achieve economic benefits for the residents of Bahama Village through an increase in tourist-related traffic. This traffic will create employment opportunities and strengthen the commercial core of the Village by capturing some of the tourist dollars being spent in Key West. Physical integration will occur through a series of transportation improvements, including vehicular access points and enhancements in pedestrian, bicyclist, and transit circulation routes.

The physical integration portion of the 1998 Plan places emphasis on the use of Angela, Petronia, Olivia, and Southard streets to serve as the primary access points into the Truman Waterfront property. The 1998 Plan recommends that the existing street grid be extended into the Truman Waterfront property via Petronia Street as a one-way street for vehicular traffic westbound into the property. Petronia Street is considered the commercial center of Bahama Village and the primary pedestrian access point into the

community. Olivia Street would extend into the property as a one-way street eastbound, whereas Angela Street would be one-way eastbound east of Dekalb Avenue and would primarily be for bicycle and pedestrian access. Truman Avenue would remain a two-way road and provide access to the site via Fort Street.

According to the 1998 Plan, it would be necessary for Southard Street to continue to provide two-way access into the Truman Waterfront property because of its physical capacity to handle large volumes of traffic. Southard Street has the greatest width of any of the east-west roadways expected to provide direct ingress and/or egress to the property.

The 1998 Plan expects all public and private transportation supporting the cruise ships docking at the Mole Pier to use Petronia and Angela streets through Bahama Village.

U.S. Navy Future Actions

At the NAS Key West Truman Annex property, the Navy plans to host a number of high tempo, transient air operations in the near future that could substantially increase transient population numbers utilizing the Truman Annex property. To support this increased utilization, JIATF East will expand its mission areas and conduct a multi-million dollar renovation of Building 289, which is a 40,000 ft² (3,716 m²) structure that is currently vacant. The JIATF East command is also constructing additional facilities to accommodate its growing mission. Once JIATF East facilities are constructed and renovated, as many as 1,000 personnel are targeted to occupy those facilities. In addition, the NAS Key West Truman Annex property will, at times, experience substantial increases in transient Navy populations, associated planned visits by Naval vessels, vacation activities and associated special events sponsored by the Morale, Welfare, and Recreation (MWR) Department. Further, as the station's bachelor quarters fully come on line, a total of 656 Navy personnel could potentially utilize these quarters during planned short term visits. Additionally, there are 102 units of Navy family housing present at Key West's Truman Annex property that can accommodate a total of approximately 400 people. When adding together all of the existing and planned activities for the Truman Annex property, the Navy anticipates the site to be, at times, fully utilized.

Also, an increase in pedestrian (vessel and public works personnel) and vehicular (fuel trucks and personnel transport vehicles) activity in and around Truman Annex is expected as a result of a projected increase in military vessel usage of Truman Harbor and the Mole Pier. The military maintains plans to access Truman Harbor and NAS Key West Truman Annex via Southard and Eaton streets.

3.11.4 Land Use Classifications

The Truman Annex planned unit development property is classified as a historic planned redevelopment and development (HPRD) district. According to the City's Comprehensive Plan, the HPRD district is intended to promote historic preservation, neighborhood facility improvement, and architectural and urban design amenities consistent with the traditional Old Town historic character.

Most of Bahama Village is classified as a historic medium-density residential (HMDR) district. The HMDR district accommodates historic Old Town medium residential development for permanent residents, including single-family, duplex, and multiple-family residential structures. The intent of the district is to preserve the residential character and historic quality of the medium density residential areas with Old Town.

That portion of Bahama Village not classified HMDR is the historic neighborhood commercial (HNC-3 and HNC-4) district along Petronia Street. This is a redevelopment area directed toward maintaining and/or revitalizing existing structures, preventing displacement of residents, and includes a commercial center linked to Duval Street.

Lands owned by the United States Navy are classified as Military. These include NAS Key West Truman Annex, the Truman Waterfront property, and Fort Zachary Taylor. (Fort Zachary Taylor is classified by the City as military land, although the land is now a state park.)

3.11.5 Land Development Control

Because of its inclusion in a military installation, the Truman Waterfront property has not been subject to land planning and development control by the City of Key West. Although the City has not exercised regulatory control for managing land and water resources at the site in the past, the City is obligated under Chapter 28-36, FAC, to coordinate with the Navy to effectively manage the impacts of Navy development on public infrastructure and natural resources.

There are three basic sources for guiding development in Key West. The first is related to the City being located within a region that is designated as an Area of Critical State Concern (ACSC) under Chapter 380, Part I, Florida Statute (FS), as implemented in Chapter 28-36, FAC. The other two sources are the Local Government Comprehensive Planning and Land Development Act (LGCPLDA), Chapter 163, Part II, FS, and the Florida Coastal Management Program (FCMP). These programs and their control of local development are discussed below.

Area of Critical State Concern (ACSC)

The ACSC program protects areas of the state where unsuitable land development would endanger resources of regional or statewide significance. Protection of an ACSC is ensured by the

Administration Commission (Governor and Cabinet) through creation of principles for guiding development that local governments must adopt.

Because of the City's designation as an ACSC, the Florida Department of Community Affairs (DCA) has review authority over all development orders, the City's Comprehensive Plan, and land development regulations (LDRs). Under Florida DCA authority, a residential growth cap exists for Monroe County and Key West related to hurricane evacuation clearance time from the Keys. To implement the residential growth cap, Key West adopted a Building Permit Allocation System Ordinance (Section 34.1375 Code of Ordinances), otherwise known as ROGO. The ordinance limited the number of building permits issued for permanent and transient units to 1,093 units between April 1, 1990 and April 1, 2002. According to the City of Key West Planning Department, as of February 2000, nearly all ROGO units issued to the City through 2002 have been allocated (Elwood 1998).

The impact of the Building Permit Allocation System on development of residential and transient units is significant. Although the exact number of ROGO units available, as reported by the building department, may change (slightly) due to changes in vested or approved development status, future development of residential or transient units is severely limited because there are few potential scenarios for creating additional ROGO units through and past 2002.

Local Government Comprehensive Planning and Land Development Act (LGCPLDA)

The LGCPLDA requires local governments to prepare, adopt, and implement Comprehensive Plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest. As part of the LGCPLDA, counties and municipalities must adopt a Comprehensive Plan that identifies goals, objectives, and policies to guide the community's development. The City of Key West Comprehensive Plan was approved by the Florida DCA and adopted in July 1993.

Pursuant to Chapter 163, Part II, FS, local governments must adopt LDRs to implement their Comprehensive Plan. The City Commission officially adopted new LDRs to implement the 1993 plan in 1997. The LDRs were reviewed and approved by the Florida DCA and the Governor and Cabinet.

Concurrency management, as defined in Chapter 163, Part II, FS, requires that public facilities and services necessary to support a proposed development be available, or will be made available, concurrent with the impacts of development. Facilities in Key West subject to the concurrency requirement include potable water, recreation, sanitary sewer, solid waste, drainage, and roads. The adopted level of service (LOS) for concurrency facilities is specified in Section 3-9.8 of the City's LDRs and established in the City's Comprehensive Plan.

Coastal Zone Management

The entire City of Key West is defined as a coastal area. In coastal areas, Rule 9J-5, FAC, requires local governments to designate Coastal High Hazard Areas within their jurisdiction. Most property at Truman Waterfront is outside the Coastal High Hazard Area and is not subject to flooding by a Category I Hurricane storm surge. Mole Pier, however, is within the Federal Emergency Management Agency's Coastal High Hazard Area (City of Key West 1997a) and is subject to hazard area development restrictions identified in Section 3-11.4 (H) of the City's LDRs.

The FCMP, the State of Florida's federally approved management program, was approved by NOAA in 1981. The FCMP compiles 23 Florida Statutes, which are administered by 11 state agencies and four of the five state water management districts, and are designed to ensure the wise use and protection of the state's water, cultural, historic, and biological resources; to minimize the state's vulnerability to coastal hazards; to ensure compliance with the state's growth management laws; to protect the state's transportation system; and to protect the state's proprietary interest as the owner of sovereign submerged lands. Consistency with the statutes constitutes consistency with the FCMP.

3.11.6 Aesthetics

Aesthetics resources at the Truman Waterfront vary between waterfront and terrestrial environments. Most of the waterfront is functional; therefore, the area possesses little or no improvements for positive aesthetics. Support infrastructure systems such as power and light poles, electric transformers, and fences are readily visible throughout the waterfront area. As infrastructure systems are the main objects present, the discontinuity of shapes and sizes negatively impacts the area. Off-setting this negative aesthetic is the natural presence of the large, deep-green water basin. The presence of cruise ships and military vessels may be aesthetically interesting to some, but not to others.

The terrestrial aesthetic resources of the area are also limited due to the lack of vegetation, and physical and location conformity of the structures. Locational conformity has been displaced over the years due to removal of under-utilized buildings. Much of the site is grass area surrounded by impervious or semi-impervious surfaces (roads and former building locations).

Overall, the aesthetic image of the property is largely negative, primarily due to the abandoned and dilapidated state of most of the buildings. The image of the property is largely due to the caretaker status the facility has been in for most of the last 10 years.

3.12 Transportation

The character of development, travel purpose, and transportation modes in Key West is markedly different from other urban areas. The compact urban character, level terrain, sunny climate, short trips,

and disproportionate number of tourist trips in comparison to other communities of its size result in a significant amount of travel by foot, bicycle, or motor scooters.

Most of the primary destination points are at the western end of the island (Old Town) and along the North Roosevelt Boulevard commercial district. Because many of the City's residents live on the eastern side of the island and many employees who work in downtown live on other Keys, travel patterns in Key West are heavily oriented westward during the AM peak hour and eastward during the PM peak hour.

3.12.1 Regional Roadways

U.S. 1 Highway provides the City of Key West's only roadway entrance from Florida's mainland, splitting into North and South Roosevelt boulevards upon entering the island. Together with Flagler Avenue, North and South Roosevelt boulevards are the major east-west roads from the east-end of the island west to Bertha/First Street. North Roosevelt Boulevard is the only continuous east-west road on the island.

Four two-lane roads funnel the majority of east-west travel west of Bertha/First Street into Old Town. These roads are Truman Avenue (continuation of North Roosevelt), Palm Avenue, Flagler Avenue, and Atlantic Avenue.

Major east-west roadways in Old Town include Eaton Street, Truman Avenue, Palm Avenue, and United Street. Major north-south roadways include Whitehead Street, Duval Street, Simonton Street, and White Street. These roadways carry the bulk of traffic in and through Old Town. Typically, the heavily traveled roads in Old Town are sufficient in width to allow parking on one or both sides of the street without significant encroachment into travel lanes. Although most of the side streets are narrow with tight corners, some street parking, which encroaches into the travel lane, is permitted. Because of congestion problems on the main roads, side streets are used for cut-through traffic, although not designed for this purpose.

To help understand the ease in which vehicular trips are able to travel over a roadway segment, a LOS for the roadway is established. A LOS is a qualitative condition (i.e., it is the driver's perception on how well traffic is moving) that is measured in terms of roadway capacity. LOS A represents the best operating condition while LOS F represents the worst operating condition (e.g., traffic gridlock). Roadway capacity is measured numerically by first estimating the maximum number of vehicular trips a roadway can accommodate at an adopted LOS (i.e., the LOS may be C) within a specified timeframe (for capacity determinations, a LOS for the AM peak-hour, PM peak-hour, or 24-hour period is generally used). The maximum number of trips a roadway can accommodate at a predetermined LOS is calculated using a transportation modeling program and is largely dependent upon the characteristic of the roadway.

Roadway characteristics include intersection conditions, such as turning lanes, volume/capacity ratios, signal phasing and timing, etc; the length of the roadway segment; the number of lanes; lane width; turning lanes, medians, pedestrian and bicycle traffic; and types of vehicles in the traffic stream.

To determine whether a roadway is operating at a lower or higher LOS than adopted, the maximum number of trips is compared to the actual number of trips (the number of actual trips can be determined by person counts or by electronic counters) occurring over the roadway. For example, if the maximum number of trips a roadway can accommodate is 600 during the PM peak hour at LOS C and the actual number of trips occurring during the period is 400, the roadway is operating at an acceptable LOS and has capacity for an additional 200 trips before the operating LOS for the roadway would be lowered to LOS D.

LOS standards for functionally classified roadways in Key West are adopted as part of the City's Comprehensive Plan Policy 2-1.1.1. Table 3-7 shows future 2003 PM peak-hour LOS for major roadways, not including vehicular trips expected to be generated as part of the Reuse Plan (City of Key West 1999).

Table 3-7				
FUTURE 2003 PM PEAK HOUR LOS FOR MAJOR ROADWAYS OPERATING BELOW THE ADOPTED LOS KEY WEST, FLORIDA				
Roadway	Roadway Segment	Roadway Classification	Adopted LOS	Project PM Peak-Hour Operating LOS
N Roosevelt	Palm Ave to Kennedy Dr	4-lane (U) state principal arterial	C	F
Truman Avenue	White St to Eisenhower Dr	2- to 4-lane (D & U) state principal arterial	C	F
Palm Avenue	White St to N Roosevelt Blvd	2-lane (U) county minor arterial	D	F
Flagler Avenue	White St to Kennedy Dr	2- to 4-lane (D & U) county minor arterial	D	F
First Street	Flagler Ave to N Roosevelt	2-lane (U) county minor arterial	D	F
South Street	Simonton St. to Reynolds St	2-lane (U) City urban collector	D	E
Bertha Street	Atlantic Blvd to Flagler	2-lane (U) county minor arterial	D	F
Eaton Street	Whitehead St to White St	2-lane (U) county minor arterial	D	F
Duval Street	United St to Truman Ave	2-lane (U) county/City urban collector	D	F
Duval Street	Truman Ave to Fleming St	2-lane (U) county/City urban collector	D	E
Grinnell Street	Eaton St to Caroline St	2-lane (U) City urban collector	D	F

Source: City of Key West 1999.

Key:

(D) = Divided Roadway
LOS = Level of Service
(U) = Undivided Roadway

3.12.2 Local Roadways

The Truman Waterfront property is adjacent to two distinctive areas that are expected to provide access routes to the proposed project site: Truman Annex Development and Bahama Village. The roadways within the areas are generally local, non-functionally classified.

Truman Annex Development

Southard Street is the only street for public use that provides for through-traffic within the development. It is also the only street that provides unrestricted access to the Truman Waterfront property. Public access limitations prohibit the use of other roadways within the development for through-traffic; however, ingress or egress via electronic gates along Whitehead Street provide through access for residents of the development. Also, the Navy has an easement for and maintains plans to use Eaton Street to access Truman Harbor and NAS Key West Truman Annex as needed.

Bahama Village

The streets of Bahama Village do not provide public access to the Truman Waterfront property. The street layout in Bahama Village is an extension of the grid street system that exists throughout Old Town. Most of the streets of Bahama Village are not functionally classified in the City's Comprehensive Plan because they are considered local roads. The purpose of a local roadway is to collect traffic from adjacent land uses and possibly several other minor streets (cul-de-sac, loops, lanes) and channel it to the collector/arterial street system. Local streets are intended to carry the lowest traffic volumes, discourage through-traffic (usually do not carry traffic between two streets of a higher classification), and provide access to abutting land.

In Bahama Village, on-street parking is generally permitted; and where permitted, automobiles often straddle the roadway and sidewalk because of the lack of available space for complete on-street or off-street parking. The roadways of Bahama Village have various right-of-way and pavement widths. North-south roadways generally have a 50-foot (15-meter) right-of-way width with an average pavement width of 24 to 32 feet (7 to 10 meters). Major east-west roadways generally have a 30-foot (9-meter) right-of-way width with pavement widths of 14 feet (4 meters). Most east-west roads dead-end into Fort Street, which parallels the eastern boundary of the Truman Waterfront property.

Physical Characteristics and Traffic Counts

The following subsections provide an overview of the physical characteristics of key roadways west of Duval Street that could be considered potential access routes to the Truman Waterfront property. All of the following roadways, with the exception of Southard Street, are within the Bahama Village area.

East-West Roadways Adjacent to the Truman Waterfront Property

1. **Southard Street** is a privately owned, two-way brick roadway between Thomas Street and the Truman Waterfront gate. The Navy has an access easement for use of the roadway; the easement is transferable. Between Thomas Street and Whitehead Street the roadway is a two-way, publicly owned roadway. East of Whitehead Street, Southard Street is one-way west bound. Roadway width is approximately 24 feet (7 meters). Curb, gutter and a sidewalk are present on each side of the roadway. Adjacent land use is residential. Southard Street is a local roadway.
2. **Angela Street** is a publicly owned two-way road. Pavement width is approximately 14 feet (4 meters) with on street parking. No curb or a sidewalk is present. Adjacent land use is residential. Angela Street is a local roadway.
3. **Petronia Street** is split as a two-way and one-way (westbound) roadway between the site and Duval Street and is publicly owned. East of Duval Street and continuing west to Emma Street, Petronia Street is one-way westbound. It is a two-way roadway between Fort and Emma streets. Pavement width is approximately 14 feet (4 meters) with parking permitted only along certain sections of the road. Curb, gutter, and sidewalks are present along the roadway. Adjacent land use along the one-way portion of Petronia Street is primarily commercial with limited residential. Land use along the two-way portion of Petronia Street is primarily residential. Petronia Street is a local roadway.
4. **Olivia Street** is split as a two-way and one-way (eastbound) roadway between the site and Duval Street and is publicly owned. Between Duval and Emma streets, Olivia Street is one-way eastbound. It is a two-way roadway between Fort and Emma streets. Pavement width is approximately 14 feet (4 meters) with on-street parking. Curb, gutter, and a sidewalk are present on the north side of the road. Adjacent land use is predominantly residential. Olivia Street is a local roadway.
5. **Truman Avenue** is a publicly owned two-way road. Between Whitehead and Fort streets, pavement width is approximately 14 feet (4 meters). Curb, gutter, and a sidewalk are present on both sides of the road. Adjacent land use is predominantly residential. West of the intersection of Whitehead Street, Truman Avenue is a local roadway.

North-South Roadways Adjacent to the Truman Waterfront Property

1. **Thomas Street** is a publicly owned two-way road. Pavement width varies between approximately 24 and 32 feet (7 to 10 meters) with parking on both sides of the street. Curb, gutter, and a sidewalk are provided on both sides of the street. Adjacent land use is predominantly residential with some commercial. Thomas Street is a local roadway.
2. **Emma Street** is a publicly owned two-way road with on-street parking. Adjacent land use is predominantly residential. Emma Street is a local roadway.
3. **Fort Street** is a publicly owned two-way road with on-street parking. Adjacent land use is predominantly residential. Fort Street is a local roadway.

During June 13 and June 14, 2000, traffic counts were collected for Southard Street, Angela Street, Petronia Street, Olivia Street, and Truman Avenue. All traffic counts were conducted at a location

along the roadway just west of each roadway's intersection with Whitehead Street. Traffic count locations were determined after a survey and evaluation of roadway configurations and traffic patterns. The locations just west of Whitehead Street were determined as the best locations for recording the average amount of traffic within the area. It was believed that traffic count locations farther west or east would result in count numbers lower and higher, respectively, given existing traffic patterns and access locations to the streets. Existing traffic roadway counts for the recorded 12-hour period are shown in Table 3-8.

Table 3-8										
EXISTING ROADWAY COUNTS, KEY WEST, FLORIDA^a										
Count Hour	Southard Street (east and west)		Angela Street (east and west)		Petronia Street (westbound)		Olivia Street (eastbound)		Truman Avenue (east and west)	
	12 hr	Peak	12 hr	Peak	12 hr	Peak	12 hr	Peak	12 hr	Peak
7 – 8 AM	175	211	20	98	18	38	33	34	58	79
8 – 9 AM	201		98		38		30		79	
9 – 10 AM	148	na	61	na	41	na	35	na	71	na
10 – 11 AM	174	na	68	na	47	na	41	na	78	na
11 – 12 PM	174		95		48		50		75	
12 – 1 PM	227		78		71		41		102	
1 – 2 PM	264		92		60		47		103	
2 – 3 PM	219		73		51		44		107	
3 – 4 PM	192		97		39		57		104	
4 – 5 PM	201	201	108	124	68	74	37	48	94	141
5 – 6 PM	142		107		57		48		132	
6 – 7 PM	135	na	70	na	48	na	52	na	97	na
TOTAL COUNT^{b, c}	2,252	na	967	na	586	na	515	na	1,100	na
AVERAGE PER HOUR	188	na	81	na	49	na	43	na	92	na

Key:

hr = hour

na = not applicable

Footnotes:

- a Counts were collected for east-west streets only. It is expected that east-west streets would carry the bulk of any traffic generated by the proposed redevelopment. In addition, the physical limitations of the east-west roadways are expected to have a more decisive role in determining potential impacts.
- b A seasonal adjustment factor was not applied to the data collected. It is expected that the amount of traffic at the count locations does not significantly fluctuate with seasonal factors because the area is largely non-transient residential with no tourist destination (exception would be Southard Street).

- c During the June survey, the amount of commercial traffic was recorded. Commercial traffic included commercial vans, trucks, and cars. The following commercial traffic numbers and percentages were recorded: (1) Southard Street with 381 commercial trips (17%); Angela with 154 commercial trips (16%); Petronia with 118 commercial trips (20%); Olivia with 72 commercial trips (14%); and Truman with 156 commercial trips (14%).

3.12.3 Other Modes of Transportation and Transportation Improvements

The most recent alternative mode of transportation study in Key West was conducted in 1996 as part of the Truman Annex Diversion Study (City of Key West 1996). The origin and destination survey component of the study was conducted at several locations in Old Town to determine modes of travel to Old Town and Key West. Major findings of the survey for residents are summarized below.

- **Resident Travel Mode.** The most common mode of travel to the survey locations in Old Town was by bicycle (31%). The second and third most common modes of travel to the survey locations were by automobile (28%) and walking (26%). The majority (54%) of the residents surveyed responded that the purpose of their trip was to come to work. Trips for social and recreation purposes were the second most reason at 33%.
- **Mass Transit and Bicycle Travel.** Existing bicycle facilities on Key West include a Class III lane along North and South Roosevelt boulevards, a Class III route along Atlantic Boulevard, and a Class III route along Simonton Street. A bicycle route along Flagler Avenue is proposed in the City's Comprehensive Plan.

As a component of the June 2000 traffic count survey, other modes of transportation were recorded. Other modes included walking, bicycle, and moped. The surveyor recorded all east-west travel passing the point of the surveyor. As a group, the following numbers of east-west movements by other modes of transportation were collected for a 12-hour period:

- Southard Street – 1,690;
- Angela Street – 524;
- Petronia Street – 1,132;
- Olivia Street – 519; and
- Truman Avenue – 591.

Transit and Shuttle Services

The Key West Port and Transit Authority (KWPATA) Department provides fixed route transit service in Key West that operates in a long narrow loop shape consistent with the shape of the island. The fixed route transit service provides access into Bahama Village along Petronia Street, Truman

Avenue, and Emma Street. The KWPATA operates a park 'n' ride shuttle from the Grinnell Street Garage to major destination points in the Old Town area. The Grinnell Street Garage is one of four parking garages in the Old Town area, but is the only one to provide a park 'n' ride service to the downtown destinations. A shuttle bus route operates as far west as Whitehead Street within the area of Old Town.

Transportation Improvements

The Florida Department of Transportation (FDOT) does not have any roadway capacity building projects for Key West scheduled in its current 5- or 10-year capital improvement program. The current project design and engineering study FDOT is conducting for north and south Roosevelt boulevards is not for capacity building (Shortal 1998). Implementation of the concepts under study would provide for pedestrian, bicycle, and vehicular safety improvements in the form of additional sidewalks, a raised roadway median, improved bicycle routing facilities, and pedestrian crosswalks. These safety improvements would provide a slight increase in roadway capacity for automotive traffic because of the better distinction and separation between automotive and non-automotive forms of travel.

Monroe County's seven-year capital improvement program does not include any roadway capacity building projects in the City of Key West (Blount 1998). The City of Key West does not have any roadway capacity building projects scheduled (Flowers 1998).

3.13 Public Utilities

3.13.1 Potable Water

The Florida Keys Aqueduct Authority (FKAA) serves the Truman Waterfront site with potable water. The FKAA is permitted by the South Florida Water Management District (SFWMD) to withdraw its supply of water from the Biscayne Aquifer at its own well field in Florida City. In 1995, a modification to the FKAA's Consumptive Use Permit established an average and maximum daily well field withdraw of 15.83 mgd (59.92 mld) and 19.9 mgd (75.32 mld), respectively, through the year 2005 (FKAA 1996).

The average and maximum daily withdrawal rate for fiscal year 1997 was 14.49 mgd (54.84 mld) and 17.60 mgd (66.62 mld), respectively.

Available potable water capacity under FKAA's existing Consumptive Use Permit is shown in Table 3-9.

When considering the 22.0 mgd (83.27 mld) design capacity of the water treatment plant, available potable water capacity for average and maximum daily withdrawal rates, using 1997 data, increases to 7.51 mgd (28.44 mld) and 4.4 mgd (16.66 mld), respectively. Currently, FKAA is permitted

by FDEP to treat 18.6 mgd (70.40 mld). The FKAA must provide the Navy with a guaranteed capacity of 2.4 mgd (9.08 mld; Demes 2000).

<p align="center">Table 3-9</p> <p align="center">AVAILABLE POTABLE WATER CAPACITY</p> <p align="center">UNDER EXISTING CONSUMPTIVE USE PERMIT</p>			
Withdrawal Categories	Consumptive Use Permit Withdrawal Rate mgd (mld)	Fiscal Year 1997 Withdrawal Rates mgd (mld)	Available Capacity mgd (mld)
Average Daily Withdrawal	15.83 (59.92)	14.49 (54.84)	1.34 (5.08)
Maximum Daily Withdrawal	19.9 (75.32)	17.60 (66.62)	2.3 (8.70)

Key:

mgd = million gallons per day
mld = million liters per day

Potable water is pumped to Key West from the Florida mainland through a series of 36-, 30-, 24-, and 18-inch (91.4-, 76.2-, 60.9- and 45.7-centimeter) pipes. Water is supplied to Key West through storage tanks on Stock Island and Key West. The four storage tanks on Stock Island have a combined 20-million-gallon (75.7-million-liter) capacity and are served by a 24-inch (60.9-centimeter) line installed in June 1998. Two 1-million-gallon (3.8-million-liter) storage tanks, served by a 30-year-old, 18-inch- (45.7-centimeter-) diameter, welded steel transmission pipeline, are located on the island of Key West (Cates 1998). Reverse osmosis plants on Stock Island with a capacity of 2 mgd (7.57 mld) and on Marathon with a capacity of 1 mgd (3.79 mld) can provide potable water for emergency situations (Cates 2000). Groundwater in Key West is contaminated with raw sewage (due to leaks in the City's sewer system [see Section 3.13.2]). However, the City of Key West estimates that approximately 300 people are using groundwater wells for nonpotable purposes (Fernandez 2000).

The FKAA provides water directly to the Navy's pumping station and water storage tank located within the boundaries of the Truman Annex planned unit development at the western end of Caroline Street. The Navy maintains an easement for the property. Operation and maintenance of the pumping station and distribution lines to the site are the responsibility of the Navy. From the pumping station, water is transported through an 8-inch- (20.32-centimeter-) diameter main along Emma Street and enters the Truman Waterfront site north of Angela Street. Besides providing water to the site, the pumping station also provides water to the NAS Key West Truman Annex property through water mains which cross the Truman Waterfront property. Most potable water mains at the site are polyvinyl chloride (PVC)

and have 6- to 8-inch (15.24- to 20.32-centimeter) diameters. The 8-inch- (20.32-centimeter-) diameter water mains, which are connected to the 250,000-gallon (946,000-liter) elevated storage tank, are believed to be cement asbestos (Ruzich 1998).

A water meter at the Caroline Street pumping stations records water consumption for the NAS Key West Truman Annex. Because the meter records water usage for the Truman Waterfront site and the NAS Key West Truman Annex, the amount of potable water used at Truman Waterfront cannot be adequately determined. In 1998, water consumption at the properties varied between 2.3 mgd (8.7 mld) and 3.2 mgd (12.1 mld). The highest level previously recorded was 4 mgd (15.1 mld). Water usage at the Truman Waterfront site is believed to represent a very small percentage of the overall consumption (Ruzich 1998).

3.13.2 Sanitary Sewer

Operation and maintenance of the City's sanitary sewer system is performed under a contract operations agreement with Operations Management International, Inc., (OMI). The collection system is divided into 8 primary districts with a pump station located in each district. Previously, all pump stations conveyed flow to pump station "A" which then pumped sewage to the City's wastewater treatment facility on Fleming Key. This conveyance configuration resulted in significant wastewater conveyance problems. With recent improvements, pump stations "B" and "C" are directly connected to the treatment plant. Pump Station "D" will also be connected directly to the plant (Fernandez 1998).

FDEP has imposed a Consent Order that requires the City to reduce saltwater infiltration by 40%, which accounts for about 40% of the wastewater flow to the treatment plant. To achieve this, the City is in the process of spending \$53 million over 5 years to rebuild 50% of its collection system and replace the existing ocean outfall with a deep injection well. Total rehabilitation of the system is projected within the 10-year Capital Improvement Program (Fernandez 1998).

The wastewater treatment plant on Fleming Key has been operating since February 1989. The plant has a design capacity of 10 mgd (38 mld) and is permitted for 7.2 mgd (27.2 mld). The most recent 12-month average annual daily flow was 7.35 mgd (27.78 mld). A permit application to operate at 10 mgd (38 mld) average annual daily flow is pending with FDEP (Fernandez 1998). Effluent from the plant is currently being discharged into Hawk Channel and the Atlantic Ocean. Effluent discharge into Hawk Channel will cease upon completion of the first deep injection well. Concentrations of total nitrogen and phosphorus in effluent discharge are generally 4 milligrams per liter (mg/L) and 1.1 mg/L, respectively (Fernandez 1998). Available EPA water quality data shows no water quality violations or benthic impacts beyond 100 yards (91 meters) from the outfall (Kruczynski 1998).

The Navy is the City's largest single wastewater customer, currently contributing approximately 19% of the wastewater system's total flow to the Fleming Key wastewater treatment plant. The NAS Key West Truman Annex property, including the Truman Waterfront property, is divided into three separate sewage systems. The system serving the Truman Waterfront is independent of the other two systems (Ruzich 1998). Wastewater generated at the Truman Annex is pumped through lift station "A."

The Navy owns and operates its own collection and conveyance system within the boundaries of Truman Waterfront. The conveyance system connects to the City's system approximately 100 feet (30.5 meters) outside the property boundary at the western end of Angela Street. A meter records sewage flow from the site. Flow is estimated at 1,748 gallons per day (gpd; 6,616 liters per day [lpd]; Fernandez 1998). Most of the conveyance system is PVC piping; however, some sections may be constructed of clay (Ruzich 1998). Between 1985 and 1990, the entire wastewater system within Mole Pier was rehabilitated. Rehabilitation included installation of a 10-inch (25.4-centimeter) force main, lift station with an oil/water separator, and 4-inch (10.2-centimeter) sanitary and bilge lines. Four-inch (10.2-centimeter) sanitary and bilge lines also run from Pier 8 along the south quay to the lift station on Mole Pier.

3.13.3 Stormwater

The City of Key West stormwater facilities are made up of a patchwork of mini-collection systems constructed as Works Progress Administration (WPA) projects and/or by City sewer and public works departments. Most of the systems constructed by City crews used substandard construction material and/or designs that have caused drainage problems. The City has identified eight flood districts, all of which are located west of Bertha and First streets. Flooding in District 4 has been minimized due to the recent completion of a stormwater retention pond. In addition to general flooding problems, several of the ocean outfalls backup into City streets during extreme high tides (Fernandez 1998).

To solve some of these problems, the City began system rehabilitation and cleaning in 1995. The stormwater system is now cleaned three times per year by OMI staff. Fifteen stormwater injection wells were installed between 1996 and 1998. These wells have triple chamber sediment traps designed to remove 95% of pollutants. By the end of 1998, triple chamber sediment traps were installed on three of the City's 20 stormwater outfalls. Some of the City outfalls have debris traps. In accordance with the 1987 Water Quality Act Amendment to the Clean Water Act, the City is not required to have a National Pollution Discharge Elimination System (NPDES) permit for its stormwater ocean outfalls. The Clean Water Act exempts municipalities with populations fewer than 100,000 from the NPDES requirements (Childress 1998).

The Truman Waterfront site is relatively flat with less than a 2-foot (0.61-meter) change in elevation. There are five drainage basins within the boundaries of Truman Waterfront, four of which flow into the water basin (City of Key West, date unknown). The fifth drainage basin flows southwest towards Fort Zachary Taylor. Stormwater flows into Truman Harbor through both point and non-point sources. Four stormwater outfalls, ranging in diameter from 18 to 30 inches (46 to 76 centimeters), discharge into the harbor. Two outfalls discharge from points along the east quay, and two discharge from the south quay. In addition to receiving stormwater from the site, the two outfalls along the east quay receive runoff from the Truman Annex planned unit development. Also, there are five outfalls near the mouth of the harbor that discharge runoff from the Truman Annex planned unit development. The site has no retention/detention facilities, nor are NPDES permits required for the outfalls (Ruzich 1998).

3.13.4 Solid Waste

The City operates a Solid Waste to Energy Facility (WTEF), which is rated at 150 tons (136 tonnes) per day, and a Solid Waste/Ash Transfer Center. At the WTEF, the average amount of solid waste material processed by burning is approximately 107 tons (97 tonnes) per day with peak rate at approximately 120 tons (109 tonnes) per day (Fernandez 1998). Non-burnable items, such as metals, white goods, concrete, and asphalt, are recycled. Ash disposal is handled by a contractor and the ash is hauled to a federally-approved monofill site in Okeechobee. Concrete and asphalt recycling, and ferrous metal recovery from ash and white goods are also handled by City-approved contractors.

The City is in the process of rehabilitating the WTEF facility to comply with the Clean Air Act. This rehabilitation includes an air pollution control retrofit scheduled for completion by 2003.

The City operates a voluntary curbside recycling program. Curbside collection of solid waste/recyclables, operation of the recycle transfer station, hauling recyclables, and marketing recyclables are conducted by a private contractor. The City has 32 categories of recyclable materials and recycles 380 to 400 tons (345,454 to 363,636 kilograms) of materials per month from the curbside program (Fernandez 1998).

3.13.5 Fuel and Gas

Diesel fuel was transported by pipeline to Truman Waterfront from the Navy's Trumbo Point Fuel Depot prior to abandonment of the depot circa 1976. At the site, the steel fuel line runs from Eaton Street, near the east and south quays, and extends onto Mole Pier. The portion of the fuel line between Trumbo Point and Truman Waterfront has been formally closed (Ruzich 1998). After the fuel lines were abandoned, military vessels fueled at the Coast Guard's D-2 north pier. However, with condemnation of the fuel lines at D-2 for logistical reasons, the Navy began refueling military vessels at Mole Pier in

September 1997, using fuel trucks dispatched from NAS Key West Boca Chica (Riherd 1998). Cruise ships are not permitted to refuel at Mole Pier (Hamlin 1998).

3.13.6 Electricity

Electrical power is supplied to the Truman Annex site by City Electric System (CES). CES provides electrical service from the south end of Seven Mile Bridge to Key West. Average daily consumption within the service area is 120 megawatts. Approximately 85% of the power consumption is to non-federal properties in Key West. CES power distribution has increased by an average annual rate of 3% (City of Key West 1997a).

Electricity enters the site at the main switch gear near the western end of Angela Street. The switch gear, which feeds the entire NAS Key West Truman Annex, functions as a circuit breaker and has nearly unlimited capacity (Ruzich 1998). Electric power is provided to areas along the south and east quays and the Mole Pier through an underground distribution system of 13,800-volt lines. From the switch gear, aboveground lines distribute electricity to the south and southwest portion of the Truman Waterfront property and to NAS Key West Truman Annex. However, near Building 1287, the distribution line is located underground.

A series of aboveground, pad-mounted transformers regulate power distribution throughout the site, including Mole Pier. The transformers on Mole Pier are each rated at 5,000 kilovolt-ampere (kVA). Although relatively new, the transformers are corroding rapidly and need to be replaced (Ruzich 1998).

3.13.7 Telecommunication

Telecommunication lines enter the property at Eaton and Angela Streets. The Eaton Street line is underground; the Angela Street line is aboveground. These systems provide telecommunication to the entire NAS Key West Truman Annex Property. The Navy provided the specially-designed conduit for the lines and Bell South provided the cable. The conduit for the Eaton Street line would be retained via easement by the Navy (Ruzich 1998).

3.13.8 Fire Suppressant System

A fire suppressant system, consisting of a salt water well, pump, and storage tank, is located along the east quay. The system was installed in the late 1980's, and has never been used, but is believed to be in good condition. The distribution system is constructed of ductile steel. There is no fire suppressant system on Mole Pier (Ruzich 1998).

3.13.9 Mole Pier Infrastructure

Infrastructure components at Mole Pier were completely renovated between 1985 and 1990 in preparation for service as a forward contingency base at Truman Harbor. Major infrastructure systems present at Mole Pier are:

- Ten-inch (25.4-centimeter) steel diesel oil line;
- Six-inch (15.2-centimeter) PVC potable water line;
- Ten-inch (25.4-centimeter) PVC sanitary force main;
- Four-inch (10.2-centimeter) sanitary and bilge water lines;
- Underground electric (13,800-volt) and telephone lines;
- Three electric substation/transformers rated at 5,000 kVA;
- Sewage pump station and oil/water separator; and
- Area lighting.